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Volume 148 — MARCH 27, 1952 — No. 13

WALDO G. BOWMAN
Editor

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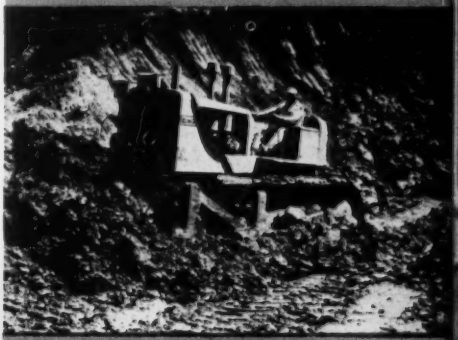

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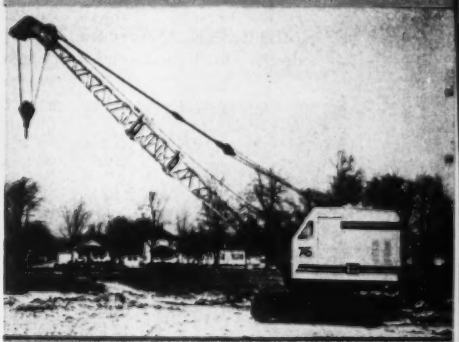

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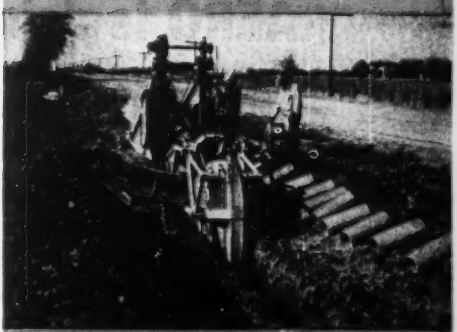

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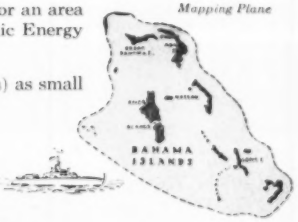

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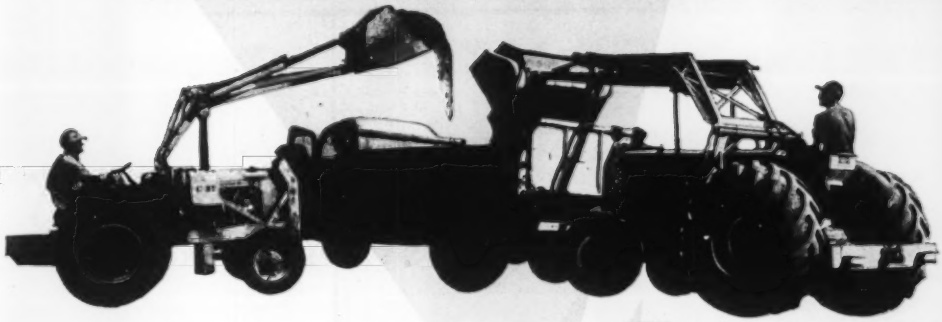

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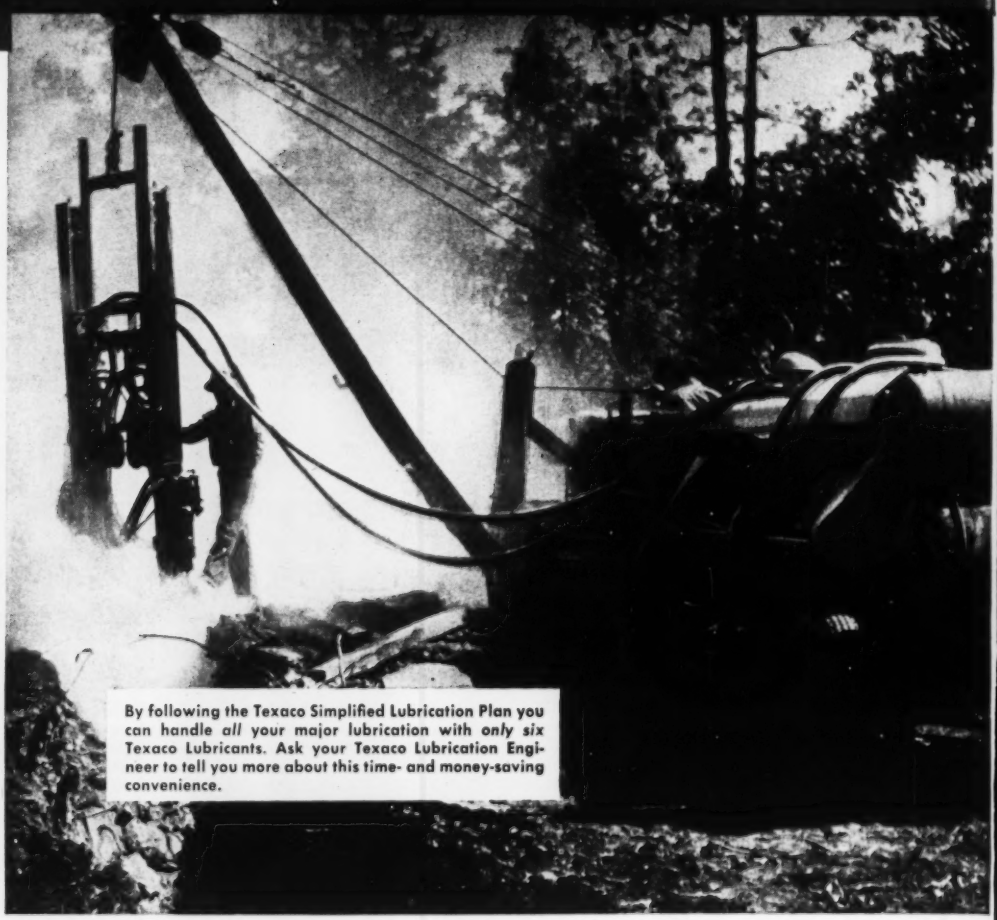

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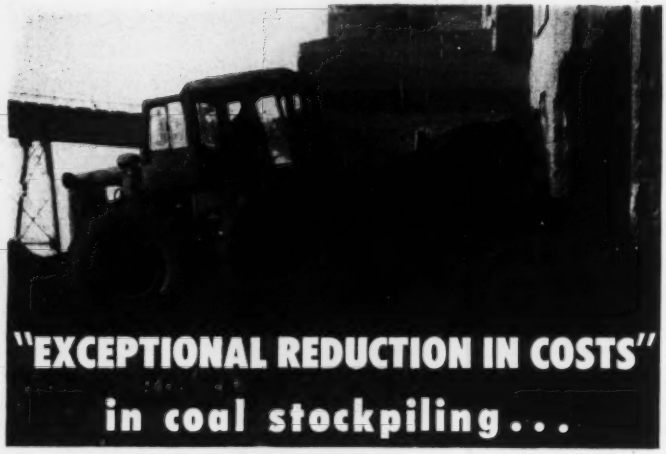

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READER COMMENT

Teaching prestressing

Sir: I have read with great interest the three letters relating to prestressing courses by Prof. G. Winter of Cornell University (ENR Nov. 1, 1951, p 65), Martin Mahler (ENR Dec. 27, 1951, p 7) and Prof. Odd Albert of Polytechnic Institute of Brooklyn (ENR Jan. 10, 1952, p 14) and should like to record my full agreement with Mr. Mahler's statement.

I have had the opportunity, for three years, of conducting evening courses on prestressed concrete for post-graduate students, mainly practical engineers. The first course 1949-50 comprised 12 two-hour lectures and 6 two-hour tutorial classes. This was just sufficient to give an adequate basis for prestressed concrete design, but subsequent developments would require a course at least three times as long. It is true, the main theoretical formulas can be shown in a few hours, but this is insufficient for design, and it is the practical application, particularly, which requires more instruction than necessary in the case of other materials.

I cannot agree with Prof. Albert's observations (1) to (3), while (4) has to be amplified.

(1) The deflection of shallow slabs or beams is not excessive, as Professor Albert states, since the prestress produces normally a counter-deflection. For example, a 40-ft purlin of 14-in. depth (i.e., depth-span ratio 1/34) designed for a working tensile stress of 700 psi, free from cracks, will have a temporary deflection of much less than the permitted maximum for the roofing cover of 1/350 of the span.

(2) Professor Albert's concern that wires may corrode applies only to post-tensioned unbonded wires. However, the larger wires used in post-tensioning are generally grouted in in Europe to secure adequate bond, and this also would give full protection against corrosion. Thin wires are used mainly with pretensioning when dense concrete is essential to insure good bond.

(3) I do not know where Professor Albert noticed that prestressed concrete will carry sound like drums. Nothing of this kind has come to my knowledge in Europe.

(4) Professor Albert observes that the loss of initial prestress in the steel may be as high as 30,000 psi. They may even be much higher if the concrete is under especially high stress, thus subjected to high elastic deformation and plastic flow. These losses must obviously be considered; e.g., in designs with which the writer has been associated, comprising 18 highway

(Continued on p. 13)

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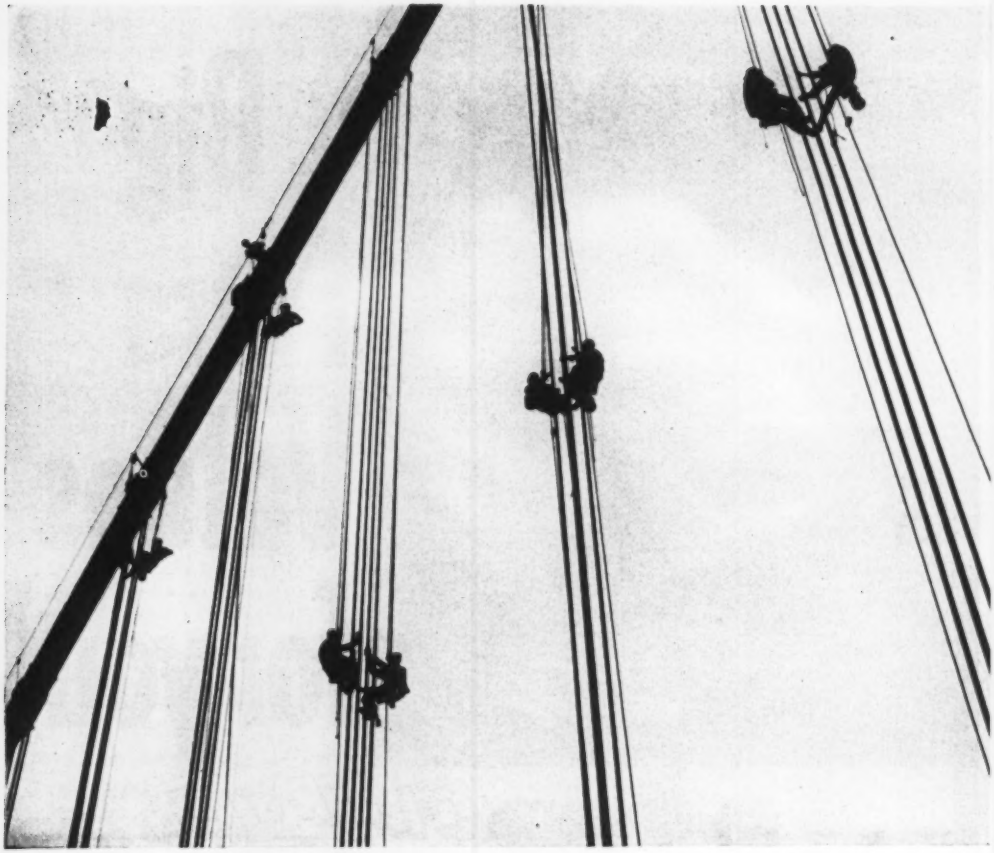

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(Continued from p. 10)

bridges of 20 to 50-ft span over railways, the initial stress of the pretensioned wires was 150,000 psi, and the design was based on an effective prestress of 110,000 psi; thus 40,000 psi was allowed for losses. The figure was obtained from test results.

P. W. Abeles
Consulting Engineer
London, England

Economy of prestressing

Sir: Homer M. Hadley's letter concerning the economy of prestressed concrete (ENR Dec. 20, 1951, p 11) raises questions that demand answers. Well known to those who have followed the development of this relatively new technique, these answers may benefit readers who are unfamiliar with the literature available and who consequently might infer from Mr. Hadley's letter certain unjustified conclusions.

In questioning the economy of prestressing, Mr. Hadley claimed the cost per square foot for the prestressed Walnut Lane Bridge was greater than for a reinforced concrete box girder constructed in King County, Wash. He asked, "So why prestress a very special and invidual structure like a bridge? Why not keep the money and buy a second bridge?"

Current widespread interest in prestressed concrete arises from the realization that the technique does provide certain advantageous features that have been demonstrated beyond question, that it is now economical under certain conditions and that after further development it may prove economical for a wider range of conditions.

Its advantages include very substantial savings in steel, increased ratio of useful load to dead load, crack-free structures, excellent load-deflection characteristics, suitability for precasting and adaptability to applications of mass-produced concrete elements.

Experience, with the opportunity for further development, will determine whether prestressed concrete can compete in the U. S. with older types of structures. Many responsible engineers believe that under favorable conditions it is economical today and that it will be more economical in the future.

Mr. Hadley's comparison of the Walnut Lane Bridge with a reinforced concrete box girder seems to me to be both unfair and meaningless. The former structure is the first prestressed bridge to be undertaken in this country, and the methods employed were taken from European practice with little modification. On the other hand,

(Continued on p. 14)

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Charles J. Curtis
Secretary

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Main Plant — Union, N. J.

(Continued from p. 13)

the box girder was of a type that had been under development for many years in this country. The cost comparison is further weakened by the fact that the bridges were built at widely separated points, under conditions that may have been quite dissimilar. Without more information, the reader cannot reasonably use Mr. Hadley's cost comparison to judge the relative economy of the two types of construction.

The inference drawn from this cost comparison that prestressed concrete is not economical is contradicted by recent prestressed bridge constructions that have resulted in plans for additional structures of the same type.

Investigation of several such bridges would disclose, I believe, that the majority are justified. It is doubtful that any are being constructed at a premium so high that it could be used to "buy a second bridge." However, a modest premium for its initial effort might be regarded as a sound investment on the part of an agency planning a large number of bridges to which prestressed concrete might be applicable.

For this premium, the agency buys experience with a very promising form of new construction.

As a result of this experience, the agency may better judge the possible economy of prestressed concrete for those bridges that are in the planning stage. Indeed, the bridges that are constructed at a later date may incorporate economies learned on the initial effort. It is encouraging to realize that these benefits are being achieved in some instances without payment of any premium.

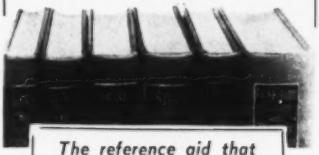
MYLE J. HOLLEY, JR.
Assoc. Professor of Structural Engineering
Massachusetts Institute of Technology
Cambridge, Mass.

Publicity for engineers

Sir: I was delighted to see your editorial comment in the issue of Jan. 17 under the heading "Silent Service Not Enough." While not wishing in any way to detract from the program of the Corporation of Professional Engineers of Quebec, I felt that you would be interested to learn that the program "Silent Service is Not Enough" was started by the Association of Professional Engineers of the Province of Ontario in November, 1950. Public relations studies under that title now are going to 10,000 members of the association.

T. M. MEDLAND
The Association of Professional Engineers of the Province of Ontario, Toronto

Save time and money on construction jobs



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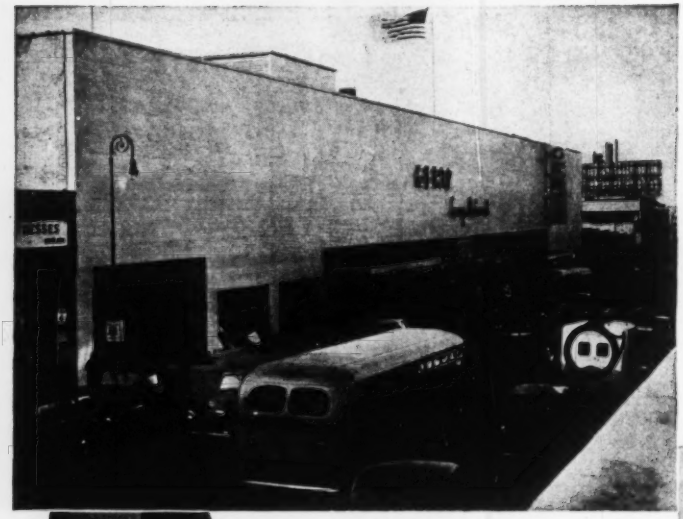

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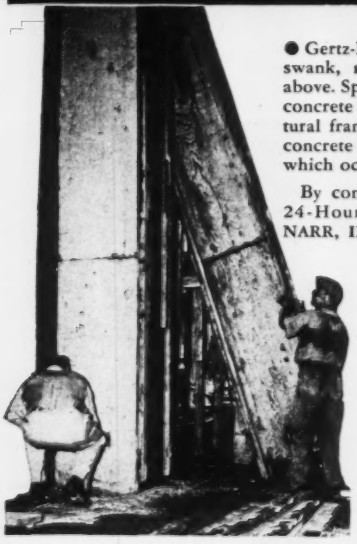

● Gertz-Flushing, north-shore Long Island's swank, new department store, is shown above. Speed and economy both considered, concrete got the owner's nod for the structural frame of new addition as well as for concrete alterations to the old bus terminal which occupied part of the site.

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BUSINESS OUTLOOK BRIGHT FOR '52

Good business, without much inflation—and more freedom for makers of civilian products—highlights the business outlook for the rest of 1952.

The big defense program is the prime force behind the high level of business. Defense spending will be rising through 1952, is expected to reach an annual rate of about $58 billion by the end of the year.

Business capital spending for new equipment and construction adds to the basic strength in the economy. Capital expenditures may run as high as $24-$25 billion, compared to about $23 billion in 1951.

Together, these programs mean high level employment and high incomes through the year. With all this money being poured into the economy, it's hard to imagine the general level of business being bad.

This good business won't come automatically—and it probably won't be felt by all industries. Experience last year shows what can happen. In 1951, consumers suddenly decided to save a big share of their incomes. As a result, many companies making goods for consumers were practically depressed while the rest of the economy was booming.

It's hard to tell what industries may have this experience in 1952. But housing is one possibility. With mortgage rates higher than a year ago, builders may have trouble getting rid of all the new houses they plan to put up this year.

But despite problems for some industries the overall volume of business—and of construction—will be very high. Total U. S. output of goods and services is expected to set a new record, and construction will reach one of the highest totals ever.

• **Not much inflation**—Prices have been shaky recently. They always are in February. But they may start to move up again soon, following the usual seasonal pattern. Industrial prices will get another boost on the cost side when wage increases are granted in steel, coal, transportation and other basic industries.

But inflation is not expected to be severe—barring a war or other catastrophe. The outlook now is for wholesale prices to level off, and probably start to decline, late in summer or early in the fall. There are two main reasons:

Shortages won't be nearly as bad as was expected earlier. "Stretch-out" in the defense program has already freed scarce steel, copper and aluminum for production of civilian goods. And more increases in metal allocations will be coming later. Other materials—including building materials and some key chemicals—are already plentiful. All this means there will be less danger of inflation from competitive bidding for these products.

• **More Freedom**—Washington is not expected to drop its overall price and production controls this year. But they will be less bothersome to businessmen—including builders—as the year wears on. With less pressure on prices, and with plenty of most kinds of goods available, the need for tight controls will be steadily reduced.

Signs of easing controls are already showing up. Washington has removed all restrictions on the use of lead. Homebuilders are now allowed to use larger amounts of steel in new houses without getting official allocations. There is talk of taking some commodities out from under price controls, perhaps easing credit restrictions like Regulation "X."

These are still small signs of change. But there will be more easing of controls—and probably some will be dropped completely—later in the year.

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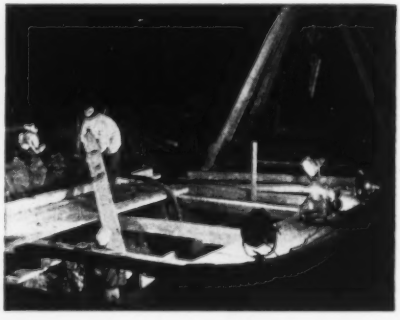

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EDITORIALS

Taxes and Construction

IT IS SAFE TO SAY that no one of the nearly 50 million persons who paid a federal income tax last week did so gladly. What is significant, however—and deadly serious—is that many millions of us paid them unwillingly.

The recent revelations of shady business in income tax collections prompted some of this unwillingness. But the real cause is a growing feeling that the tax-take is unfairly high. Coupled with this is a dawning realization that it is dangerously high for the good of the economy and the solvency of the country.

The world—both ancient and modern—is full of examples of nations whose carelessness in administering a tax system or whose greed or short-sightedness in fixing tax rates has led to their impoverishment or downfall. The thought begins to emerge that it could happen here.

All of this is of vital interest to those who make their living from construction, for they, even more than most classes of citizens, have a vital stake in a sound tax system. It is, of course, tax revenues that pay for that kind of construction known as public works. Even in boom times, such as at present, public works—federal, state and local—account for about a third of all construction business. And the proportion may rise to as much as two-thirds in depression times.

The stake in public works of those who finance such facilities, and who design, build, operate and maintain them is obvious enough. So, therefore, is their concern with a sound tax system.

What may not be so plain—but is equally true—is that those in the construction industry who depend upon privately-financed building will also be hurt by a bad tax policy. Indeed it is they who are right now in the front ranks of those threatened by the present trends in the federal income tax.

IN 1951 THIS TAX took 30% of the national income. Nearly every individual paid at least 15%, large numbers paid 25% and others paid up to 50%. This tax bite, plus the high cost of living, leaves progressively less savings that the individual can invest with house builders or in other enterprises that buy construction.

Moreover these enterprises—commercial and industrial—are being placed in the same predicament. For the time is fast arriving when they can't, because of taxes, finance needed capital expenditures out of their earnings. Nor is borrowing the money any more practicable if taxes don't leave enough surplus to pay the interest and amortization charges.

Last year, for example, many a company paid $2 in taxes for every $1 it could keep in earnings—in other words worked 8 or 9 months out of the 12 for the federal government. The danger is that, with so little left for a company's own use, two things—both bad—happen. The incentive to increase profits and therefore production is removed. And there is a tendency to extravagance and unsound "business expense" spending. The net result is reduced construction.

People who make their living from construction thus have a very personal interest in the tax question. And since most of them are interested in both public and private construction, it is important to note that while high taxes may increase public construction, they also discourage or make impossible the carrying out of private construction. Where the best level of taxes for maximum effect on construction lies it is difficult to say. But it seems certain that the present level is too high.

THE FACT THAT a more healthy construction picture would result from lower taxes is, of course, unimportant in itself. The broader view, of vital concern to the whole country and its economy, is that people are becoming unwilling to stand the high tax take. Avoidance and evasion of taxes are sure to follow.

And once a government can't collect taxes, it is no longer a government. Under a wise and reasonable tax system, citizens regard avoidance of payment a crime; under an unfair one they will justify evasion as a necessity and without taint. This has been the forerunner of governmental breakdown in too many instances to dare chance it.

In any event it is becoming increasingly apparent that taxes have already exceeded the safe limit and must start down. This means a cut in governmental expenditures, which requires some prayerful soul-searching. Can our military security be purchased by taking less than the 60% of the tax dollar that it is budgeted for at present? Does this security require another 13% of the tax dollar for foreign aid? Can more federal borrowing be justified when 7% of taxes now goes for interest on the national debt? Are veterans' pensions too liberal when the cost is 5% of the federal tax income? Since the above requirements take 85% of the government's income, what economies can be made in the so-called ordinary expenses of government to make the remaining 15% go farther? How much of ordinary expenses really go for frills—subsidies, even social welfare and public works—that are not necessary?

Clearly, no question is more important to the country generally nor to construction people specifically than what to do about taxation. On the answer hangs, by an ever-more-slender thread, the bright future that those who make their living from construction have come to regard as sure. It is not so certain but that unwise taxes can destroy it.—Waldo G. Bowman

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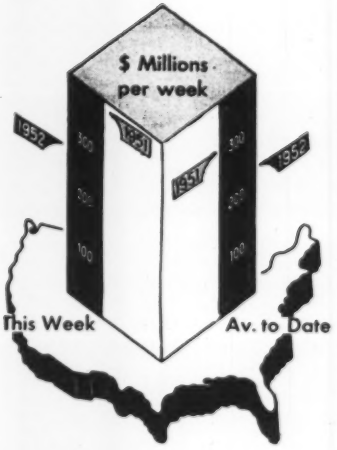
THE CONSTRUCTION WEEK



Contracts by type of work

	This Week	Cumulative 13 wks 1952	1951	% chge
Waterworks	$3.8	$65.4	$62.2	+5
Sewerage	4.6	49.7	81.5	−39
Bridges	16.9	77.5	68.3	+13
Highways	29.4	266.9	232.8	+15
Earthwork, waterways	5.6	99.1	83.4	+19
Buildings:				
Public	36.1	386.7	638.1	−39
Housg., pub.	28.6	236.5	163.2	+45
Housg., priv.	49.1	690.0	514.9	+34
Commercial	8.1	121.5	182.7	−33
Industrial	63.4	698.1	1,509.7	−54
Unclassified	26.0	336.6	407.6	−17
Total	**$271.6**	**$3,028.0**	**$3,944.4**	**−23**

NOTE: Minimum size projects included are: Waterworks and waterway projects, $34,000; other public works, $60,000; industrial buildings, $82,000; other buildings, $300,000.

ENR COST INDEX

Index Base = 100		1913	1926	1948
Constr. Cost	Mar. '52	550.60	264.67	115.42
Bldg. Cost	Mar. '52	407.21	220.12	115.75
Volume	Feb. '52	386	157	112

FHA CRACKDOWN—A Florida vacation and loans to a Federal Housing Administration official have led the FHA to blacklist three Indiana firms and suspend an architect. FHA will do no more business with: Mid-City Investments, Inc.; W. A. Sheets and Sons, Inc., general contractor; and Allen and Kelley, architects. The action stems from a $375,000 mortgage on a Fort Wayne apartment house owned by R. Earl Peters, state FHA, who was fired in January and since has died. An FHA architect was suspended for two weeks for taking a Florida vacation, partly at one firm's expense.

GOLD IN THAT THAR SLUDGE—Milwaukee has a million-dollar-a-year product in the vitamin B-12 that can be extracted from Milorganite, sewage-sludge fertilizer that the city has commercialized on for nearly 25 years. Estimating this potential gross profit, consultants to the Milwaukee Sewage Commission recommend a novel filtration plant at the sewage works for extraction of the vitamin. Verne Alden Co., Chicago consulting firm, has worked up plans for extracting some 200 lb annually from the 65,000 tons of Milorganite produced—without impairing value of the fertilizer.

CANADA'S AEC GROWS UP—A major step to further Canada's atomic energy program will be taken next week. On April 1 the project will be divorced from the National Research Council by establishment of a new separate crown company. The new organization will take over all of Canada's atomic energy work, including the plant at Chalk River—140 miles northwest of Ottawa. It will also build the $30-million pile recently announced to Parliament.

WAFFLE BLOCK ROOF CRASHES—An accident sent one of the waffle block roof slabs being used in construction of one of 40 terminal buildings for Atlas Terminals Corp., Miami, Fla., crashing to the ground last week. One workman was slightly injured. Damage was estimated at $4,000. Developer Laurence G. Farrant (ENR Feb. 21, p. 30) and Contractor Morris Burk said one of the Youtz-Slick liftup jacks either failed or a workman making an adjustment didn't do it right. This threw a 175,000-lb slab out of true and it dropped about 4 ft. A section about 6 ft by 50 ft broke off. Atlas officials said the mishap will have no effect on plans to build the other 39 buildings by the same process.

IN THIS ISSUE—Third-quarter allotments (p. 23) . . . Industry disperses new plants (p. 24) . . . Construction of overseas airbases probed . . . (p. 26) . . . Wind blamed for building collapse (p. 27) . . . House opens hearings on Hells Canyon Dam (p. 28) . . . ENR industrial backlog reaches $9.3 billion (p. 31) . . . Contractors report metals supply easing (p. 32) . . . Labor leader seeks unity with contractors (p. 39) . . . Knoxville planning fight halts expressway (p. 45) . . . Local funds spur New England construction (p. 52) . . . Simple pier bents made with large-pipe piles (p. 64) . . . Welded building erected without bolts (p. 66) . . . Used concrete pipe goes back to work (p. 69) . . . Intake sunk into position (p. 70) . . . Rubberized runway tested on airfield (p. 75) . . . India makes progress on its "Hoover Dam" (p. 79) . . . Special camera aids foundation work (p. 90). Secrets of "atomic furnace" revealed (p. 164).

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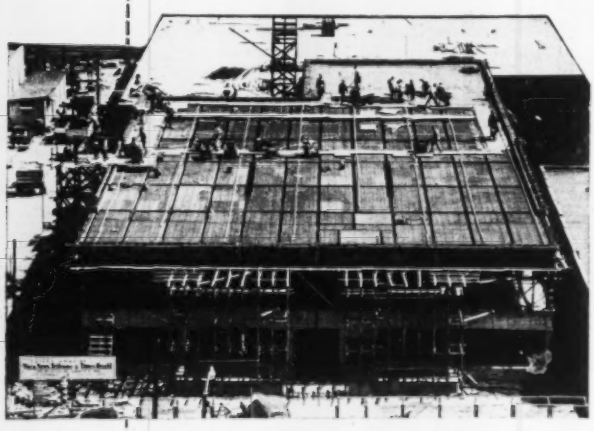

Looks better . . . and it's more durable – All concrete in the NEWS-TRIBUNE and TIMES-HERALD building, Waco, Texas, was made with Duraplastic air-entraining cement.

THERE'S A GOOD REASON why the Moore Construction Company, Austin, Texas, used Atlas Duraplastic air-entraining portland cement for this building. R. B. Moore, Jr., reports that with Duraplastic they get "a more homogeneous, honeycomb-free, plastic and workable concrete with less water bleeding."

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DPA spurs non-defense building

Third quarter allotments of controlled materials are slightly larger than second quarter for 31 industry programs and somewhat smaller for 20.

Total allocations, as announced this week by the Defense Production Administration, are higher than second quarter for steel, copper and aluminum.

Allotments for industrial building are reduced, while the quantities for commercial-religious and some other types of construction are increased. This change is in line with the progress of industrial expansion, which reaches its peak in the second quarter.

Among the general claimant agency programs that receive larger third quarter allotments are schools, apartment houses, highways, airport and airway facilities, army civil works, coal mines, civil defense, and oil and gas construction. These increases show up in the accompanying table. Reductions are indicated in the same listing for farm construction, atomic energy projects, electric power facilities, Interior Department jobs and veterans hospitals.

As predicted by ENR, the announced allotments will allow a moderate increase of civilian construction. DPA Administrator Manly Fleischmann pointed out that military allotments are about equal to revised second figures. Despite these large allocations, he said, "it has been possible to provide additional authorization for maritime ship construction, schools, hospitals, commercial construction, and automobiles and trucks, and also to make increased allocations for production of civilian goods of all types."

• **Other changes**—Large allocations are made for the manufacture of both construction machinery and building materials. The Water Resources Division gets more steel for water supply and sewage projects, but its allotments of copper and aluminum are cut.

Steel available for distribution in the third quarter is estimated at about the same as the second quarter, and the supply of aluminum is estimated to be slightly larger. Copper is expected to remain in tight supply.

Fleischmann noted that for the third quarter the decision has been made to increase the over-allotment in order to insure that all of the mill production is taken up and put into production under the CMP program. The third quarter over-allotment in carbon steel is 17%; copper brass mill products, 16%; copper wire products 10%; copper foundry products, 23%; and aluminum, 13%.

Recent experience has shown that this level of over-allotment is needed in order to balance the rate of "attrition."

Allotment of Controlled Materials for Third Quarter 1952

	Total Steel (tons)	Total Copper (000 lb)	Aluminum (000 lb)
I. NPA DIVISIONS			
Agr. Mach. & Impl. Div.	549,250	8,850	9,400
Aircraft Div.	20,240	1,780	10,200
Aluminum & Magnesium Div.	.....	.....	4,300
Building Materials Div.	903,600	57,945	68,000
Canadian Div.	556,500	3,335	1,900
Chemical Div.	260	991	4,750
Communications Div.	41,775	52,720	4,000
Construction Machinery Div.	564,025	7,785	2,300
Consumer Durable Goods Div.	953,269	46,044	77,671
Containers & Packaging Div.	1,540,150	100	24,000
Copper Div.	38,600	3,700	1,500
Electrical Equipment Div.	594,650	168,200	34,000
Electronics Div.	63,525	31,500	12,900
Engine & Turbine Div.	583,000	31,823	3,435
Facilities Bureau			
Construction Controls	90,070	1,970	1/
Industrial Expansion	529,500	25,970	9,000
General Components Div.	1,161,750	183,110	22,000
General Ind. Equip. Div.	568,000	45,950	19,000
Iron & Steel Div.	160,150	4,161	110
Leather & Leather Prod. Div.	9,650	1,064	600
Lumber & Wood Prod. Div.	6,008	160	1,050
Metalworking Mach. & Equip.	561,250	29,900	9,950
Mining Mach. & Equip. Div.	135,420	3,555	260
Misc. Metals & Minerals Div.	3,540	2,450	160
Motion Pic-photo Prod. Div.	6,219	1,162	2,900
Motor Vehicle Div.	3,294,450	120,830	65,625
Ordnance & Shipbuilding Div.	124,975	11,175	1,500
Printing & Publishing Div.	5,520	1,160	640
Pulp, Paper & Paperboard Div.	850	65	100
Railroad Equip. Div.	1,773,373	85,950	4,970
Rubber Div.	28,338	3,610	950
Scientific & Tech. Equip. Div.	51,745	41,700	13,400
Service Equip. Div.	40,450	2,685	3,720
Water Resources	230,089	2,800	200
NPA—(Ex. Reserves) Total	**15,190,191**	**984,500**	**414,491**
1/Included with industrial expansion			
II. GENERAL CLAIMANTS			
Agriculture, Dept.	47,010	1,085	45
Army, Dept.	36,425	1,510	90
Atomic Energy Commission	106,603	6,404	5,804
Civil Aeronautics Admin.	25,317	1,432	515
Defense, Dept.	2,394,945	261,823	228,739
Defense Electric Power Admin.	296,025	62,250	61,300
Defense, Fisheries Admin.	509	25	4
Defense Materials Proc. Agency	50,750	2,100	250
Defense Solid Fuels Admin.			
Coal Mine Construction	13,050	355	25
Coke Oven Construction	26,180	410	5
Defense Transport Admin.	90,240	2,684	150
Federal Civil Defense Admin.	15,000	60	20
Federal Security Agency			
Education	145,060	5,420	200
Hospitals	75,625	3,025	170
General Services Admin.	25,145	3,470	100
Housing and Home Finance Agency	95,000	3,320	100
Interior Dept.	5,718	148	25
Maritime Admin.	128,875	2,020	150
OIT-MSA	951,500	10,360	2,000
Petroleum Admin. for Defense	1,903,750	9,050	1,500
Public Roads, Bureau	352,000	610	200
Veterans Admin.	8,817	1,275	55
General Claimants—Total	6,793,544	378,836	301,447
NPA—(Ex. Reserves) Total	15,190,191	984,500	414,491
NPA Reserves (General)	125,000	11,000	15,000
NPA Reserves (Hardship cases)	55,000	4,000	3,000
NPA—Field Case Account	810,630	28,052	18,000
DPA—Total Reserve Set Asides	2,434,995	105,408	51,213
Grand Totals	25,409,360	1,511,796	803,151
Supply	21,611,800	1,301,000	710,000
% of Supply	117.6	116.2	113.1

Industry disperses plants

By Vincent B. Smith
Washington Staff

Industry locates the bulk of its new plants away from cities, in smaller places or open country. That fact stands out in the latest study, just completed, of industrial construction awards for the eighteen months ending Dec. 31.

More than half of the million-dollar industrial jobs initiated during that period are located beyond the metropolitan areas surrounding cities of 200,000 or more. Only one-sixth of the new industrial projects went into the cities themselves. Almost twice as many were located in the metropolitan areas—embracing hundreds of thousands of square miles—outside the city limits.

Only private industrial projects with an estimated construction cost of $1 million or more were included in the study. ENGINEERING NEWS-RECORD construction reports were selected as a unified basis for the analysis because they offered the most comprehensive, centralized listing of projects covering the United States.

No government works, utility projects or commercial buildings were included in the study. It was confined to private factories and industrial plants.

• **Trend traced**—The accompanying table shows the distribution of industrial projects during the eighteen months—following Korea. In all, new facilities or additions were undertaken for 446 plants. Estimated construction cost, exclusive of plant production equipment, totals nearly $3.2 billion.

On a basis of cities of 200,000 or more, the table indicates that 55% of the new plants or additions went to places outside the metropolitan areas of these cities. Another 29% went to locations inside the metropolitan areas but outside the cities. Many of the latter plants are in small places or on open land.

For purposes of the study, census bureau definitions of metropolitan areas were adopted. Many of these areas are large. The Pittsburgh metropolitan area, for example, takes in four counties, and the area for Youngstown embraces two Ohio counties and one in Pennsylvania. Milwaukee's metropolitan area is restricted, being confined to Milwaukee county, but other single-county areas—such as those for Columbus, Ohio, and Birmingham, Ala.—take in much larger territories.

• **Percentagewise**—Little of industrial construction is going into smaller cities of the next size bracket—100,000 to 200,000 population. Private industry put only 33 projects, or 7% of the total, into cities of this size—beyond the metropolitan areas of the bigger places.

To be completely factual, six projects could be added to the total for cities of 100,000-200,000, increasing the number to 39. These jobs, costing less than $7 million, went into cities of this size that are included in the bigger metropolitan areas.

On a cost basis, there is a striking disparity between big-city projects and other projects. Only 9% of the construction expenditure was slated for cities of 200,000 or more, as compared with 16% of the projects. Expenditures for the surrounding metropolitan areas of these cities, by contrast would show the largest average construction cost per plant. The dollar total for this bracket, however, includes one construction cost figure of more than $300 million as the price for a single plant.

Industry has been following pretty much the same pattern of decentralization since World War II. The territorial information department of the Commonwealth Edison Co., Chicago, made an earlier analysis of industrial construction awards of $100,000 and more reported by ENR for the three years from July 1, 1945, to June 30, 1948. The study covered 2,392 new plants and additions.

Of this total, 1,308 (nearly 55%) were in and around places of less than 100,000, and 1,084 (a little over 45%) were in and around places of more than 100,000. The percentages compare closely with those developed in the latest analysis of million-dollar industrial projects for the eighteen months starting July 1, 1950.

Where Industrial Plants Are Going

Million-dollar construction awards for private factories

Reported in ENR, July 1, 1950, to Dec. 31, 1951

	Number of new plants or additions	%	Estimated construction cost (millions)	%
Cities of 200,000 or more	$ 72	16	$ 288	9
Metropolitan areas around cities of 200,000 or more	127 (A)	29	1,090	34
Cities of 100,000 to 200,000	33 (B)	7	204	7
Metropolitan areas around cities of 100,000 to 200,000	14	3	72	2
Rest of U. S.	200	45	1,514	48
Total	$446	100	$3,168	100

(A) and (B) contract awards for metropolitan areas around cities of 200,000 or more include six plants (with estimated construction value of $6.5 million) located in cities of 100,000 to 200,000 that lie inside metropolitan areas of larger cities.

Civil functions probe to open this week

Army Civil Functions take the congressional spotlight again this week. Federal policies and practices on flood control and river and harbor projects are to be aired in public hearings before a special congressional subcommittee.

Caustic criticism of the whole system for handling these projects spurred the House Public Works Committee to action last summer. By resolution, it created a nine-man special subcommittee to study civil works. Rep. Robert E. Jones of Alabama, is chairman.

A wide field for inquiry was assigned to the special committee. It was authorized to "study the policies, practices and procedures in connection with authorization and construction of river, harbor and flood control projects."

Five months of preliminary investigations by the subcommittee and its staff has laid the groundwork for the hearings. The committee hopes to holds sessions from March 27 to April 8 and to resume about April 21, after the Easter recess.

Federal agencies will be heard first, with the Corps of Engineers and the Agriculture Department leading off during the first week. Following those agencies, the committee will hear witnesses from the Interior Department, Federal Power Commission, Budget Bureau, Tennessee Valley Authority and perhaps the International Boundary and Water Commission. All of these agencies have been consulted in the preliminary discussions. Non-federal organizations that wish to appear will be heard later.

Wage-price rise in steel will hoist building costs

Mobilization policies in the steel industry wage dispute are going to add a new spurt—and a big one—to spiraling construction costs.

The CIO steel workers have accepted the recommendations of the Wage Stabilization Board as a satisfactory basis for further negotiations with the industry. They also went along with WSB's request that a possible strike be postponed to April 8, with a promise to give four days advance notice of any strike on April 4, so that steel plants may bank their furnaces and avoid damage.

Whether there is a strike on April 8 will hinge largely on what kind of a deal the industry gets on a price increase. It looks like this will be a political decision made by President Truman. Defense Mobilizer Charles E. Wilson, Economic Stabilizer Roger L. Putnam, and Price Director Ellis Arnall are reported to be alarmed over the possibility that the WSB recommendations may shatter the anti-inflation program. Wilson is discussing the situation with the President.

WSB puts the direct labor costs of the package settlement it proposes at less than 25 cents per employe-hour. The union puts the figure around 26 cents. Industry officials estimate the total cost—direct and indirect—at about 60 cents for each employe-hour.

Assuming WSB's figure is correct, Truman may come up with a price increase of around $5 to $6 a ton. This would be almost a repetition of 1946, when a month-long steel strike was ended with an 18½-cent wage increase and a $5 price increase. OPS figures the industry isn't entitled to an increase of more than $3 a ton under the Capehart Amendment, but Truman could easily raise it to $5 if necessary to avoid a steel strike.

Steel industry leaders are determined to get what they feel is adequate price relief if the increased wages are granted. They estimate a $12-a-ton price hike will be needed to meet the WSB package proposal in its present form.

• **Building costs**—Whatever the outcome of the dispute, both the increase in labor cost and the increase in steel prices will have a direct impact on building costs. And of the two, the effect of increased labor costs will be the larger.

Here's how it will work: Take, for example, a building which will use 1,000 tons of steel structurals. A price rise of $5 a ton will result in adding $5,000 to the cost of the building.

Now let's assume a wage increase package of 25 cents an hour. The structural steel fabricator will have to pay this increase over and above the increased cost of steel. The two biggest fabricators—American Bridge Division of the U. S. Steel Co., and the Fabricated Steel Construction Div. of Bethlehem Steel Co.—will get nearly the same contract as their parent companies.

Direct and indirect labor costs for fabricating structural steel may total $50 a ton. An increase of 25 cents hourly in labor costs will boost this another $7.50. Added to the $5-a-ton price increase—the cost of fabricated structural steel will go up $13.50. And it is not yet erected at the site.

Cost of erection will be climbing also (ENR March 20, p. 23) as the result of earlier WSB policies permitting a 22½-cent hourly increase in the AFL building trades. This will take the cost per ton of structural steel erected up another $2 to $3. This makes the total cost rise about $15 a ton for structural steel—and adding $15,000 to the cost of the building in our example.

But structurals are only one of the many steel shapes used—often less than one-third of the total tonnage of carbon steel that may be used in a typical building. Fabricating costs and building trades costs will be piling on the other shapes used also.

WAGE-POLICY "heat" is on Stabilizer Putnam.

One bright spot for the construction industry among the recommendation is: WSB's disapproval of a clause on "contracting out" construction work. With CIO members only dissenting, WSB said the demand that companies not contract out certain repair, maintenance and construction work should be withdrawn by the steel union. AFL members concurred in this because of AFL building trades opposition to the demand. The Associated General Contractors also has expressed opposition.

Bids asked on Fort Ritchie project

Public competitive bids will be invited next week for the long-delayed Army construction project at Fort Ritchie, Md. The Washington District, Corps of Engineers, last week announced its intention to issue the invitation about April 1 and to open bids 30 days later.

Col. Alan J. McCutchen, district engineer, and his staff were rushing work in revised plans and specifications to meet the April 1 date. Basic plans are little chaged from the originals of last October except for deletion of small items—such as certain excavation—accomplished in the meantime.

Of bids submitted for negotiation Oct. 2, the lowest was offered by John McShain, Inc., for $6,578,425. The other bids ranged from nearly $8 million to more than $11.5 million. McShain refused to accept the contract without satisfactory negotiation, and the Comptroller General ruled in an opinion last month that McShain was not bound to take the job at the price which had been proffered (ENR Feb. 28, p. 25).

The Comptroller General's opinion does not prevent the Army Engineers from carrying the case to the courts if they wish. Prices received in the open competitive bidding will determine their action. If the award has to be made at a higher price than McShain offered, the engineers are likely to attempt to recover the difference from the McShain firm.

Other considerations would enter into the case. The job has been seriously delayed by McShain's refusal to go ahead without negotiation.

Time would have been saved if the district engineer could have awarded the contract to the second bidder, John A. Johnson & Sons Co., a firm that has done much first-class work for the Corps of Engineers. But other factors prevented such an award at the time when it would have helped speed the job.

Overseas base builders get shake-up; Congress shuffles construction bills

Here is a round-up of current congressional activities which have broad impact on the construction industry:

• **Overseas bases**—Secretary of Army Frank Pace, Jr. last week started a "complete shake-up" in Army Engineers in charge of building air bases in North Africa. He also promised "remedial action" with Atlas Construction Co., a combine of six major private contractors, which is building the projects now under fire of the Senate Preparedness Subcommittee.

Pace sent a task force under Brig. Gen. Horvell E. Walsh to take charge of the clean-up. He said they would relieve Col. George Derby and Lt. Col. Leonard Haseman, now in charge.

His action followed testimony before the subcommittee from Col. Harry Reed, chief of Army Auditing Agency and veteran of 35 years' Army Service, in which he said he had found evidence of fraud, mismanagement and waste in construction of the bases.

He was one of a string of witnesses last week who reported that haste, waste, and corruption were responsible for jumping the cost of the five bases in Morocco from $300 million to around $455 million. They said that "millions of dollars" must be paid to correct mistakes made in the rush construction of the strategic bomber bases. They warned that hastily built and expensive runways may not hold up under operation of heavy bombers.

John W. Leahy, Bronxville, N. Y., former purchasing coordinator for Atlas Construction Co., testified that he quit after a contract for a hangar was awarded over his protests without formal bids. Leahy disputed claims of Atlas company and Air Force officials that the urgency of the rush job accounted for the shortcuts.

Atlas Constructors lashed back against the charges in a public letter last week from J. B. Bonny, chairman of the firm's operating committee. He denied all irregularities and said the company had been refused an opportunity to testify. It called testimony offered thus far "unbalanced" and "unsubstantiated." The letter offered refutation in detail of major specific charges.

• **More money**—House Banking and Currency Committee has reported out a House joint resolution upping by $52 million FNMA pre-commitments available for permanent mortgage financing. Last year's housing act provided $200 million for FNMA pre-commitments, but this failed by $45.5 million to cover all the applications. So the House committee action last week will enable Fannie May to cover the pending applications that came in before the Dec. 31 cutoff date. Senate will act on the resolution after it completes action on extension of Defense Production Act, which was expected to be this week.

JOHN W. LEAHY testified on air bases.

• **Less housing**—Public housing got its second setback of the session on the House floor last week when ceiling for starts in fiscal '53 were cut to 5,000. An Independent Offices Subcommittee earlier had slashed the Administration's request for 75,000 starts to 25,000. Last year a House floor amendment cut starts to 5,000 units, but the Senate upped the limit to 50,000. Public housing people are counting on the Senate to restore again a part of the cut made by the House.

• **Decontrol**—Senate Banking Committee is willing to let DPA handle decontrol of materials. DPA has plans to begin decontrolling materials around the end of the year, provided no new emergency. What the Senate committee is most concerned with is price controls. It has served notice on OPS to provide a decontrol formula for prices of goods by April 10 or it will write a rigid formula in its extension of the Defense Production Act.

• **Construction block**—The House Expenditures Committee voted this week to take back $4 million previously given to Andrews Air Force Base near Washington for construction of dormitories. The action was taken after unanimous approval of a subcommittee report that was highly critical of the Andrews program. "Inadequate planning, administrative bungling, uneconomical and unsound construction policies," were charged in the report by the subcommittee headed by Rep. Porter Hardy. Some 40 dormitory-type buildings are now under construction at Andrews. The committee action blocked seven more not yet started, plus three of four bachelor officers' quarters. Contractor involved is the Truckman-Barbee Construction Co., Inc., of Washington. The House Appropriations Committee is now studying the Hardy report.

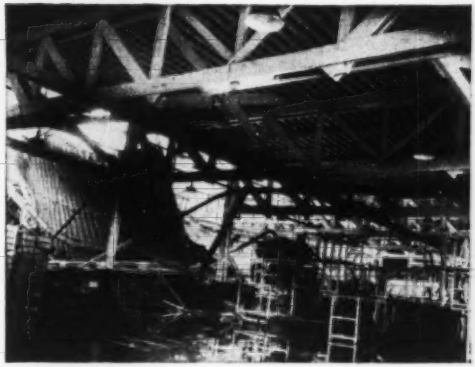
• **Reclamation projects cut**—The Interior Department appropriation bill which the House took up this week was reduced by the Appropriations Committee from $626,001,000 to $492,434,000. That represents a reduction of $133,567,000 and is $36,836,000 below the 1952 appropriations. Of the cutback, construction projects accounted for $94,187,000.

The biggest construction cut was in the Bureau of Reclamation where $41,364,000 was whacked off construction and rehabilitation projects. Bulk of this cut was made possible by a $30-million carryover of unobligated funds from the 1952 budget.

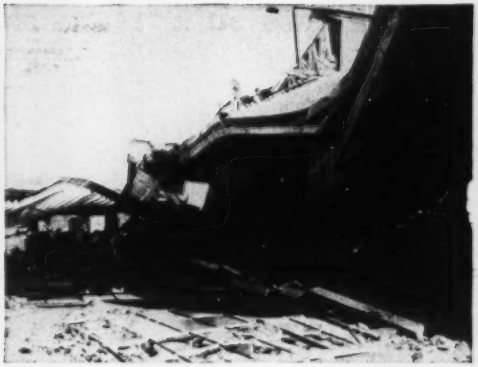
A policy of no new starts provided for the bulk of construction fund cuts. In Bureau of Indian Affairs $30,546,000 construction money was cut. In Southeastern Power Administration, $5,390,000 was cut from construction. In Bonneville Power Administration, $3,763,000 was cut, and $12,094,000 was cut from funds for the projected Alaskan Railroad. Further cuts were expected in consideration on the floor.

• **N. Y. builders testify**—Representatives of the New York Building Congress appeared before the Senate Banking and Currency Committee last week to testify in behalf of amendments introduced by Senators Ives and Lehman of New York, which would make more building materials available in areas hit by unemployment. The amendments would provide for allocating steel and other building materials on a regional basis and by projects.

While here, the group met with Manly Fleischmann, DPA director, who assured them that more controlled materials will be made available for civilian construction in the third and fourth quarters. As a result of Fleischmann's assurances, the group, headed by J. Francis Hayden, chairman of the Construction Control Committee of the New York Building Congress, decided not to press for adoption of the amendments.



Collapse of the Metals Products Co. plant's roof . . .



and destruction of the west wall seem unrelated, engineer reports.

Wind blamed for building collapse

At approximately 3 p.m. March 10, a large section of the roof, and the entire west wall of the American Metals Products Co. plant at Union City, Tenn., collapsed. Three workmen were injured. Damage was estimated at $200,000.

There was no apparent connection between the damage to the west wall and collapse of the roof. Edward Lannon, chief engineer for the West Tennessee Division of Forcum and James Construction Co.—builders of the plant—said "damage was completely unrelated." He believes it resulted from "a violent air disturbance."

Cause for the failure has not definitely been established. Lawrence Smith, plant manager, has employed a Union City engineering firm, Bransford and Nichols, to make further investigation into the collapse of the structure.

• **Building details**—The building was approximately 280-ft long and 180-ft wide. Walls were of masonry and aluminum sash. Above the brick line, aluminum siding was built on wood sheeting.

The roof was three bays wide, a high center bay, flanked by two lower bays. It was supported by wooden trusses, spaced 20 ft apart. Trusses consisted of three 60-ft spans which were 7 ft deep. Trusses were built of 2 x 12's and rested on columns of 8-in wide flange steel beams. They were supplied by American Roof Truss Co., Chicago.

Wide angle knee braces were welded to the flange and bolted to the trusses. The trusses supported a wood deck that was covered with tar and gravel. Brick piers on the exterior wall supported the trusses. The building was designed by C. L. T. Gabler, Detroit architect.

• **Details of collapse**—The day the cave-in occurred, high winds buffeted Tennessee. At Memphis (100 mi south of Union City) the barometer reading was 29.1, lowest since 1902. Likewise in Nashville (about 135 mi east of Union City), where the reading was 28.32.

During the day a high pressure area moved across the state. Housetops were blown off, trees were uprooted and fences knocked down in various sections. Weathermen in Nashville said conditions were ideal for a tornado. Highest wind gusts recorded there were about 60 mph.

Engineer Lannon does not know whether the roof and west wall collapsed simultaneously or whether one preceded the other. He said it appeared that the west wall had been "blown out" as if by an explosion, or had been torn from the building by suction.

The wall definitely did not topple, he said. It had the appearance of having been taken apart brick by brick. It was completely dismantled and strewn about the ground. The bricks were torn apart. The sash above the windows, the 8-in. wall above the sash, and the brick piers were all separated.

The roof section that collapsed was about 60-ft wide, 280-ft long, and 40-ft high. Lannon said it was "obvious" the trusses failed. Why they failed is an unanswered question.

Some of the knee braces were "twisted to pieces," he said. Other knee braces were left intact although the trusses fell. The bolts and ring connectors of the knee braces in some cases were pulled through the truss timbers. The north wall of the building bulged from the subsequent excess strains.

Investigations to date show nothing to indicate a structural failure or overloading.

• **Doubt left**—Plant Manager Smith said the strongest gusts he had found reported at Union City were no greater than 30 mph. He said the barometer reached a low of under 29 during the day. Rainfall between 7 a.m. and 3 p.m. totalled about 1.81 in.

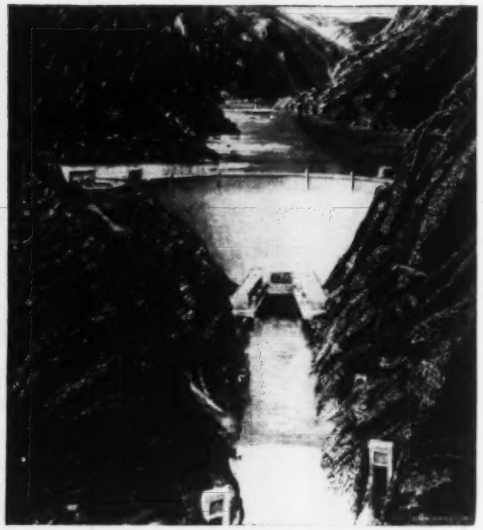
The daily newspaper Union City Messenger made no mention of high winds or storm. Its story of the mishap left the impression that a structural failure had occurred independent of the elements.

The plant, which manufactures automobile parts for the Ford Motor Co. assembly plant in Memphis, is out of business. It was protected by extended coverage insurance. Although no plans for reconstruction of the building have been announced, Smith indicated it will be rebuilt.

Anti-trust action

The Department of Justice Anti-trust Division announced it is investigating construction prices by plasterers and lathers in Chicago, and has subpenaed 50 building and trades organizations, unions and individuals with their records.

Included was the Chicago Building Trades Council and its chief. They were summoned to appear before a grand jury March 25. Willis L. Hotchkiss, head of the anti-trust division here, said that the investigation stems from charges of monopoly control over construction charges in Chicago and the surrounding area, with particular attention to plastering and lathing groups.



HELLS CANYON DAM as it will look if completed according to plans now before the House Interior Committee.

LOCATION of proposed Hells Canyon Dam on Snake River in Idaho is shown in map above.

Hearings open on Hells Canyon Dam

Debate which has been raging in Idaho for years over the question of the Hells Canyon Dam moves this week to the hearing room of the House Interior Committee.

Construction was proposed in President Truman's budget message. He requested $6 million to start preliminary phases of the $357-million dam and power plant. With transmission facilities, total cost of the project would approach $500 million.

Identical bills to authorize the project have been introduced in both House and Senate. The legislation was proposed by Interior Secretary Oscar L. Chapman on the basis of plans prepared by the Bureau of Reclamation.

Hearings have been scheduled for six days: two for proponents, two for the opposition, one for outside witnesses and one for rebuttal. Federal proponents – including congressmen and senators, as well as representatives of the Interior Department–were expected to lead off the testimony.

Proponents aim chiefly to start the ball rolling at this session. They have no sound basis for hope that Congress will act on authorization this year.

Among the major opponents is the Idaho Power Co. It wants to build five low-head plans in the stretch of river that would be drowned out by Hells Canyon Reservoir. These five run-of-river plants would produce 530,000 kw of firm power. Reclamation claims a much greater firm output for Hells Canyon, especially when integrated with other federal power plants in the Northwest.

At the site, the Hells Canyon plant would produce 688,000 kw of firm power. In addition, it would provide 432,000 kw of prime power at downstream plants by regulating the flow of the Snake River.

Further, as Reclamation engineers explain it, the project would be entitled to a credit of 310,000 kw of firm power produced at other plants through integrated operation. The whole bundle adds up to 1,430,000 kw of prime power to the system.

As now proposed, the project would include benefits to flood control, navigation and recreation.

• **Location described**–Site of the dam would be in the Grand Canyon of the Snake River, a region of wild, rugged beauty and desolation. The deep creek site now recommended is some 247 miles upstream from the mouth of the Snake River and about 104 miles downstream from Weiser, Idaho.

Hells Canyon Dam, as now contemplated by Reclamation, would be a massive arched concrete structure for impounding water to el. 2077, creating a power head of about 607 feet. The power plant, designed for construction along the downstream toe of the dam, will have an installed capacity of 800,000 kw from eight units, with provisions for future installation of one additional unit. The dam would create a reservoir of 4.4 million acre-ft, with a surface area of 24,800 acres and a length of 93 miles.

The top of the dam will be at el. 2082, about 722 ft above the present-known lowest point of the foundation. This height is comparable to the 726 ft height of Hoover Dam. The hydraulic height between reservoir and tailwater surfaces will be 602 ft, as compared to 574 ft for Hoover Dam. Length of the dam will be about 1,733 ft; the top thickness 45 ft; and the maximum thickness at the base about 426 ft.

At the damsite, and for several miles up and downstream, the Snake River Canyon has been eroded in a thick series of ancient lava flows predominantly basalt. Metamorphism, by pressure and heat of deep burial, has greatly improved the rock from the engineering viewpoint. The rock is very hard, dense, and resistant to weathering, factors which assure excellent foundation and abutment conditions.

• **Concrete control**–As now designed, the dam would require placement of about 5,100,000 cu yd of mass concrete. Cement and pozzolanic material requirements for this mass and other concrete placement might be about 4,100,000 bbl.

Placement of the mass concrete by modern methods and construction speed would require control of con-

FIELD PARTY makes preliminary survey in the Grand Canyon of the Snake River, site of proposed $357-million Hells Canyon Dam and power plant.

crete-setting temperatures by cooling methods. Cooling would be accomplished by placing layers of 1 in. O.D., pipe tubing 5 ft apart throughout the mass of the dam and circulating through them either river water, if cool enough, or some sort of refrigerant such as brine. In addition to the cooling procedure for control of cracking, the dam would be constructed with a system of vertical joints.

Since Hoover Dam was built, many advances have been made in designs and controls for concrete manufacture and placement. As a result, Reclamation engineers have been able to design a layout for Hells Canyon Dam that will save over a million cu yd of concrete.

• **Spillways**—To pass the maximum probable flood at the site, it would be necessary to construct spillways of 300,000-cfs capacity. Designs for bypassing this water around the power plant call for releasing the flood waters through two radial gates 48 ft wide by 59 ft high at each end of the dam. Discharges through each pair of gates would flow into an inclined spillway tunnel connected to the downstream half of a previously-used river diversion tunnel.

Each of the two spillway tunnels, one in each abutment, would be concrete-lined; the downstream or horizontal portions would be 42 ft in dia. Combined length of the two spillway tunnels would be about 4,800 ft.

The plans make provision to supply downstream river demands of as much as 40,000 cfs in the event that power water releases should be less than enough to meet the need.

Flood waters would be returned to the river about 1,600 ft downstream from the power plant, thus assuring no interference with power production.

• **River diversion**—In construction of the dam and power plant, a major feature would be diversion of the river. It is expected that, when fully excavated to bedrock, the depth would be at least 110 ft below normal river level and 205 ft below the top of the upstream cofferdam.

Diversion would be provided for floods up to 100,000 cfs by excavating a 50-ft dia tunnel about 4,300 ft long in the rock of each abutment around the damsite. The rock and its structure are believed to be of such quality that little or no lining with concrete would be necessary. Each tunnel would have a 50 x 50-ft bulkhead gate at its entrance and a 42 x 42-ft bulkhead gate at its outlet, to shut out river water during construction of plugs in the tunnels at the bottom of the inclined part of the spillway bores. High pressure slide gates would be installed in each plug to permit meeting downstream river demands during the filling of the reservoir up to or above the entrances to the outlet works.

More than a half million cu yd of earth, gravel, sand and other materials would have to be moved to expose bedrock and abutments for the new dam. In addition, 1.5 million cu yd of rock would have to be excavated.

The Reclamation Bureau estimates that a minimum of six to seven years would be required for the construction of a project of the magnitude of Hells Canyon Dam. It is anticipated that between 5,000 and 6,000 workers would be employed at the peak of construction.

NEWS BRIEFS

• **Water**—Bids will be opened April 9 for construction of a water treatment plant at Fairbanks, Alaska, to be operated in conjunction with a new-steam generated electric power plant recently completed. To prevent freezing of water in the city distribution system during severe winter weather, cold water from wells first will be heated to about 60 deg F in the power plant where it will be used as condenser water. First plant in Alaska to provide full water treatment, the plant will process a maximum of 1.4 mgd. . . . Lake Erie's water level is higher than ever in history. February showed it up to an elevation of 574.2 ft, 3.7 ft above the 570.5-ft low water datum used as a nationwide reference plane in determining the degree of water level fluctuations. This surpasses the former record high in 1863 by .17 of a foot. It will be good for shipping interests, bad for owners of shore property.

• **Power**—Delaware Power & Light Co. plans a $40-million expansion program over the next three years to fill the power needs of expected development in the Delmarva Peninsula. . . . The Hartford Electric Light Co. has been granted a certificate of necessity for fast tax write-off of $14.5 million in plant expansion at Middletown, Conn. —55% of the project. . . . Kansas City Power & Light Co. has announced a $22-million construction budget for expansion projects in 1952.

• **Redevelopment**—C. A. Fielland has been awarded a $3-million contract for razing 24 acres of the "Scrub," worst slum in Tampa, Fla.—and construction of 500 low-rent apartments.

• **Highways**—A measure expected to pass the New Jersey legislature calls for a November referendum on the question of state backing for a $285-million revenue bond issue for completion of the Garden State Parkway as a toll facility. It provides that if tolls from the 165-mi highway from Paramus to Cape May were unable to pay off the bonds, the deficit would be paid from taxes. . . . Construction of a 5-mi four lane highway between Old Fort, N. C. and Ridgecrest in the Blue Ridge Mountains calls for the moving of 2,800,000 cu yd of earth and rock and clearing timber from about 115 ac of right-of-way. W. E. Graham & Sons is doing the job. . . . Bids will be opened April 22 for construction of steam-heated ramps to the John F. Fitzgerald Expressway in Boston. Estimated cost is over $3 million.

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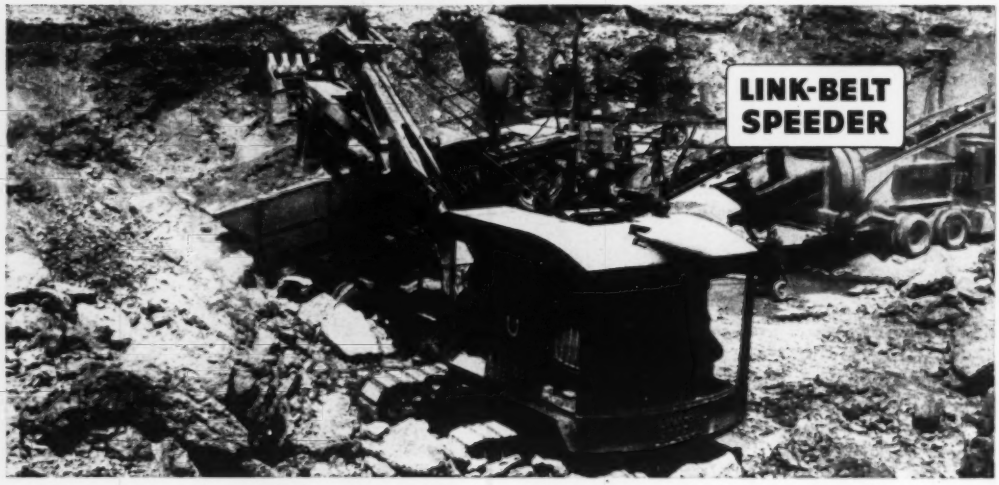
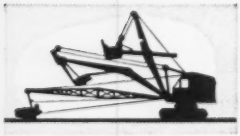
with LINK-BELT SPEEDER's super ¾ yard shovel-crane



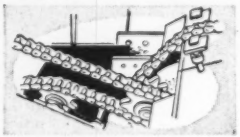
Here's the power and stamina it takes to work in rock and other stubborn material. This rugged LS-85's massive all-welded construction, ground-hugging stability and fast operating cycle keep output and profits at a peak.

Here are other Link-Belt Speeder PLUS FEATURES that work for you



Convertibility — designed for peak production as shovel, crane, dragline or trench hoe. Convert in field—quickly, easily.

All-Welded Lower — extra strength without extra weight. Resists impact and twist. Field service simple, fast.



Independent Chain Crowd — is fast and positive. Self-adjusting to all boom angles. No cables to break, slip or adjust.

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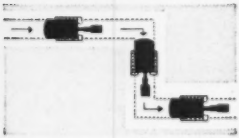
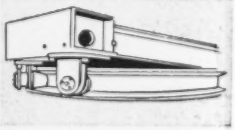


Turns on a Dime. Either track can drive or be locked independently. Digging lock controlled from cab.



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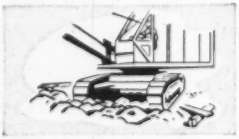

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ENR backlog shows $9.3 billion planned for industrial construction

There is a strong demand for industrial building carving out more than $9 billion worth of future business for the construction industry.

And that demand is almost certain to grow stronger in the next few months because of the Defense Production Administration's "Come and get it" policy announced last week. Manly Fleischmann, DPA administrator, invited the construction industry to go ahead with commercial and industrial projects that have been turned down by controls officials in the past.

Builders who shelved plans for industrial projects around the first of the year (when DPA said it would cut back on industrial construction) are now dusting off blueprints to get an early start on construction. And more projects will reach the plan stage, to build the backlog higher. It is already big.

ENGINEERING NEWS-RECORD's backlog of industrial construction shows $9.3 billion in proposed work on the books as of Feb. 29. This is 96% above the industrial backlog figure for June 30, 1950, immediately after the start of the Korean War.

Growth of the industrial building backlog was the same in both the first and second half of 1951—$1.8 billion.

During the first two months of this year, there has been little change in the level of the backlog. It stood at $9.4 billion at the end of 1951, and $9.3 billion on Feb. 29.

• **Where is the demand?**—Biggest single chunk of the industrial building backlog (32% is for projects located in the states west of the Mississippi River (not including the Far West). In this region, Texas leads individual states, accounting for 60% of the backlog in the area.

The Midwest accounts for 25% of the $9.3 billion on the books. Illinois and Ohio together want to build 60% of the $2.3 billion in industrial projects planned for the Mid-West.

The South and the Middle Atlantic states split 30% of the total backlog, with $1.4 billion each. The balance of the industrial building backlog goes this way: The Far West has 8%, and New England, 4%.

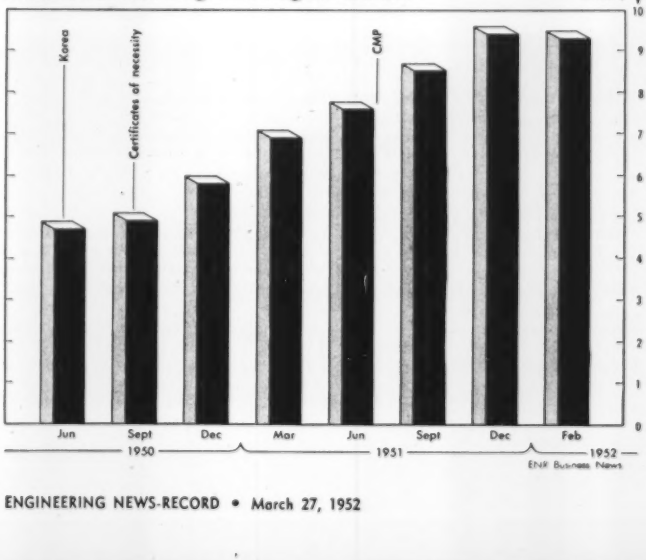
ENR's figures show that 55% of the total industrial backlog is concentrated in seven states. Led by Texas with $1.8 billion is proposed industrial construction, they are: Illinois, $800 million; Ohio, $700 million; Pennsylvania, $500 million; and California, Indiana, and New York, accounted for $400 million each, the backlog showed.

The steady demand reflected in the backlog comes at a time when contract awards for industrial construction are still maintaining a healthy rate, although under 1951's record.

Industrial building contract awards, as reported by ENR, for the first twelve weeks of this year totaled $635 million. This was 55% below the $1,398 million for the same period in 1951—but 183% above the comparable 1950 period.

The chemical and processing industries are still the biggest factor in industrial building, according to ENR contract awards. For the first two months of this year, these industries contracted for $134 million worth of new construction. Public utility construction was second, with $78 million.

Industrial building backlog levels off



Cement companies plan major expansions in 1953

Additional expansion of portland cement plants to produce 6.5 million barrels during calendar year 1953 was forecast last week by Ralph S. Trigg, deputy administrator of the Defense Production Administration for program and requirements. The added supply would take care of expected deficits in five areas.

This expanded production would be in addition to the total national supply of approximately 261 million barrels previously estimated for next year.

Here are the local areas and the amount of expanded capacity planned for each:

New England states area, 1 million barrels; Carolinas area, 1 million barrels; Mississippi-Louisiana-Texas-Oklahoma area, 2 million barrels; Minnesota-Wisconsin area, 1 million barrels; the Oregon-Idaho area, 1.5 million barrels.

DPA said sufficient applications for certificates for rapid tax amortization have been received for expansions in all areas, with the probable exception of the New England states.

• **Cement production down**—Production of finished portland cement in January totaled 17 million barrels, 2% less than in January, 1951, the Bureau of Mines reported. Mill shipments totaled 12.7 million barrels, 4% more than in January, 1951, while stocks of 22.3 million barrels were 23% higher than at the same time a year ago.

(*Continued on next page*)

Construction Business . . .

Builders say steel is more plentiful

Defense Production Administrator Manly Fleischmann told the Senate Small Business Committee last week that the government could not abandon its Controlled Materials Plan prematurely without hurting the economy by starting a scramble for steel, copper and aluminum.

The general tenor of his testimony was that structural steel, copper and aluminum are still not in good supply. ENGINEERING NEWS-RECORD made a spot-check throughout the nation, talked to contractors and learned these facts:

In Los Angeles, officials of the Associated General Contractors and the Building Contractors Assn. gave this picture:

Residential building has not suffered at all from steel or aluminum shortages, except for periodic difficulties in getting some manufactured items such as water heaters, disposals, etc. One AGC official said:

"The people in Washington have painted a wholly unrealistic and scare-filled picture of the metals situation."

Heavy construction has suffered from small allocations, but there has been no trouble in obtaining the steel or aluminum allotted. On the one hand the steel mills seem to have plenty of the stuff, but on the other hand the NPA isn't allotting it, he said. Steel companies are said to be hustling for business, talking architects into putting steel back into small buildings.

Industrial contractors in the San Francisco area report no difficulty getting steel as long as they have priorities. Robert McCarthy Co. uses mostly reinforcing steel and finds the supply adequate, has no difficulty getting pipe, says the real shortage is in copper wire.

Peter Kiewit Sons Co., is having no trouble getting steel and says deliveries are fast—except pipe. Henry Doelger Co., residential and commercial builders, say the steel situation is not easy but better than three months ago. Most of their trouble is in getting reinforcing steel. They have no trouble getting pipe or aluminum.

These are a few brief examples, but they indicate the trend.

• Salesmen out—In New Mexico contractors working on a $3-million AEC project are being solicited by phone and by salesmen offering all regular items—rods, plate and sheet. Nails and wire are plentiful. Others find small structurals and small angles are easing up now. Galvanized pipe is scarce.

In San Antonio, Texas, contractor Luther H. Hill says all shapes are easer to get, and added that the thaw seemed to have begun last November or December. Home builders say there never has been any shortage of building materials.

A surplus of structural steel of standard and light types exists in the Denver, Colo., region, according to Charles E. Brokaw, regional chief of the National Production Authority. But heavy steel shapes are still tight.

• Midwest report—In Milwaukee, Wis., three general contracting firms handling commercial and industrial construction made these observations:

Structural and reinforced steel supplies are easier to get, with deliveries on most shapes having been promised in about four weeks. Three months ago delivery was three to six months. One firm used aluminum railing recently and had no trouble getting it.

Some fabricators are trying to work off sizeable steel inventories by substituting sizes. Reinforcing steel is critical, one reported, but deliveries on the whole are about 25% better than six months ago.

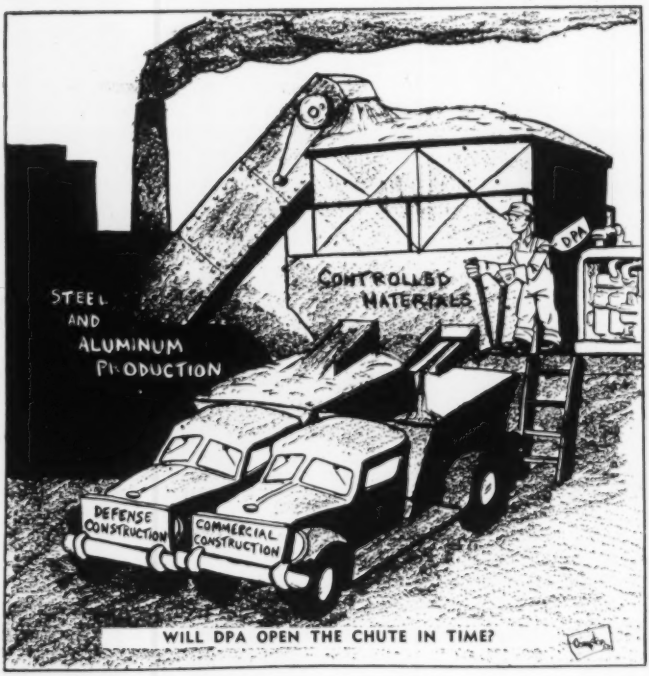
Homebuilders say they can buy all the steel they want, but the government won't let them use it. Wholesalers are pestering them to sell steel angles, reinforcing rods and I-beams. Black pipe is not hard to get, but galvanized and copper pipe is short.

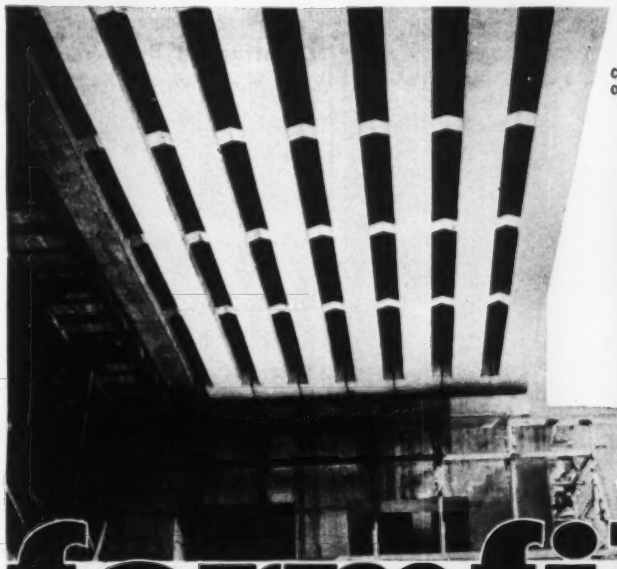
Steel fabricators said deliveries have improved and estimate they have shortened by about 60 days in the last nine months. A 1,000-ton job a year ago would take about six months, but now the steel can be expected in about three months, depending upon CMP tickets, one said.

In Chicago, big building contractors say none of their jobs are being held up for lack of steel. One reported the shortage of reinforcing rods and structural steel has eased up in the last 45 days. Another said delivery time has been reduced from two months to six weeks. Homebuilders reported that materials supplies are no problem.

Sauer, Inc., industrial piping contractor, Columbus, Ohio reports pipe more plentiful, with copper pipe in shorter supply than steel, but becoming more plentiful. "Conditions are rapidly approaching a buyers' market," the company says.

• Other areas—Throughout the South, the Middle Atlantic, and New England, reports from contractors all told a similar story. A lot of the shortage appears to be talk and not fact.





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Construction Business . . .

A. R. CARNOY . . . he says yes!

To license—or not to license

With a preliminary rumble of steak-mellowed voices, and a snapping of matches and lighters, the contractors settled back in their chairs to listen to a formal debate on a vital subject.

Should contractors be licensed, as are engineers, architects—and barbers and plumbers?

The scene was a roadhouse in Westchester County's swank North White Plains district. The affair was a regular meeting of the Westchester County Building Trades Employers Association. The debaters were I. Roy Psaty, head of the New York City construction firm of Psaty & Fuhrman—who opposed licensing; and Alan R. Carnoy, of Carnoy-Wolter Const. Corp., of White Plains (a home building concern.)

• **Arguments pro**—There was little need for preliminaries—the subject was well known and much discussed among the men present. A. A. Murphy, president of the group, banged a soup spoon against a pitcher of ice-water for attention, introduced the speakers, and told them to go ahead.

Carnoy opened the debate: "If the Pilgrims were to land in America today," he said, "about the only thing they could do without a license would be to build houses or other buildings.

"Nearly everything today is controlled by licensing—except building. There isn't even an age limit on it, a five-year old child can get a building permit.

I. R. PSATY . . . he says no!

"It can be argued that present controls on building—city-issued permits, city inspection, health inspections, bank and mortgagor inspections and the like—are enough. But all of us know there aren't enough inspectors, they don't work long enough hours—and they're too easily influenced.

"The answer is licensing. It would gain public confidence; it would keep out the quick-profit boys; it would make building a stable profession; it would make possible accurate records of who is in the field, what he builds and what he uses; it would establish the responsibility of the contractor to the public."

• **Arguments con**—Not so, said Psaty.

"First," he said, "there's enough government regulation now, and I don't want to see any more.

"Second, you can't legislate to protect a man against himself. I can't conceive of a law that would insure financial responsibility of a contractor. Nor can I conceive of a law that will prevent a foolish buyer from buying something he hasn't properly checked and evaluated.

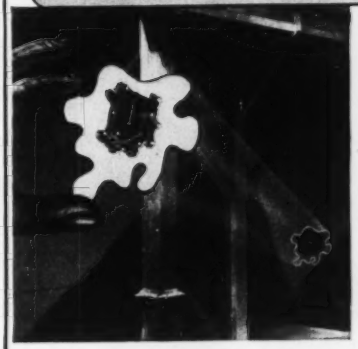
"I can see also that licensing might result in creating a lot of little Chinese Walls around the country—and we are people who don't work in a fixed place under fixed conditions.

"Rather than control by licensing, I'd suggest something like this:

"The warranties that the home builders are promoting now (ENR March 6, p. 29) are a fine first step. They should be followed by a second one—the warranties should be backed by a surety bond on the contractor.

(*Continued on next page*)

FIT A SPECIFIC NEED



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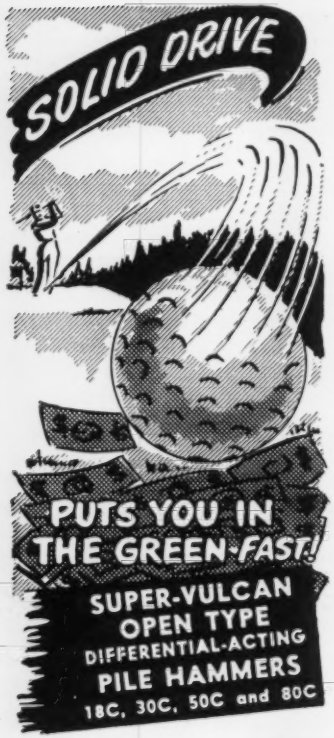

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Construction Business . . .

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• **Rebuttal**—A rumble of approval followed the remarks. Undismayed, Carnoy returned to the attack.

A number of states, he said, have been licensing contractors for some time. Among them is California.

"Out there there are roughly 60,000 contractors licensed, and in the past year, some 3,000 complaints were filed for various violations. Of these, about 1,000 resulted in revocation of license.

"Many of the contractors out there expressed surprise that we operate without licensing. They wanted to know how we can be sure that the sub will finish his work.

"Licensing is obviously the answer."

• **And re-rebuttal**—"I've also checked California," said Psaty. "They tell me that one reason the licensing is working is because of the absence of politics on the board, and the stature of the men who make it up.

"I'm not sure we should trust the future of an industry to an unending succession of non-political and high caliber people. I'm not sure we can always get them."

Some of the contractors leaped into the debate at this point—most of them also to express disapproval of the idea.

There was no vote, of course. But it was obvious few in the audience wanted anything to do with licensing.

NPA charges Ohio firm with CMP violation

The National Production Authority last week filed a complaint alleging that Alsco, Inc., of Akron, Ohio, used 1,485,000 pounds of aluminum in excess of its allotments between December, 1950, and 2,014,000 pounds in the second half of 1951.

Alsco is the nation's largest manufacturer of aluminum storm windows and doors.

The company said its troubles stemmed from confusing government regulations. It added that it was willing to curtail its use of aluminum to "repay" the excess amounts used.

Alsco purchased more than 3 million pounds of aluminum from foreign sources. The company said the purchases were made on the understanding that this was not prohibited by NPA. Later, the company said, NPA told the firm that such purchases were prohibited.

Building cost indexes show small increases

The Marshall and Stevens building cost index for March rose two points over December, 1951, and now stands at 432. A year ago, the index reading was 429. In this index, 1913 100.

Marshall and Stevens industrial equipment index went up four-tenths of a point from December to March, and now reads 181.0 (1926 100).

E. H. Boeckh and Associates building cost index for commercial and factory type buildings advanced 1.1 points in January, to 239.1, compared with 238.0 in December and 237.7 in January.

For brick and concrete commercial and factory buildings, the Boeckh index was 274.2 in January. It has risen 7.6 points since November.

Meanwhile, the Associated General Contractors monthly construction cost index for February remained at 378. The AGC index rose four points in a year.

United Kingdom to buy construction machinery

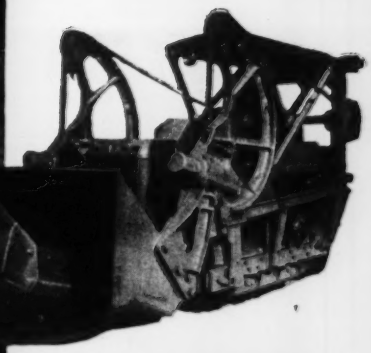
The Mutual Security Agency has authorized the United Kingdom to spend $5.5 million for U.S. machinery.

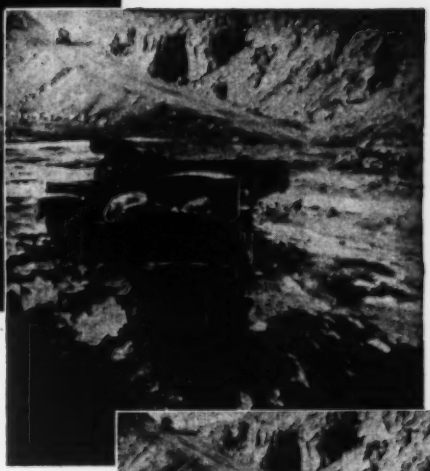
Included in the authorization is $4 million for tractor parts and used wheel-type tractors, and $1.5 million for tracklaying type tractors, 50 h.p. or more, and contractors' type wheel tractors.

Business Briefs . . .

• **Concrete awards**—The Portland Cement Association's report of sq yds of concrete pavement awarded in February shows increases over the January totals in two categories—streets and alleys and airports. Concrete pavement awards for roads were down. February awards totaled 987,948 sq yds of portland cement concrete for roads, compared with 1,496,636 in January; streets and alleys, 1,856,458 in February, compared with 1,369,455 in January; and airports, 878,649 in February, compared with 621,356 in January.

• **Housing starts**—February housing starts totaled 77,000, according to the Bureau of Labor Statistics, 13% higher than January. BLS said the easing of the material supply situation was probably responsible for the increase in starts in virtually all sections of the country. Reporting an increase in the number of building permits issued in January and February, BLS predicted a continued rise in housing starts for March.





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RICHARD J. GRAY is easy to get along with but . . .

. . . he could be rough. (ENR photos by Compton)

AFL's Gray puts a fresh outlook on unity in the building industry

Contractors find Richard J. Gray is mighty easy to get along with when it comes to joining in against industry-wide encroachments on free enterprise.

Veteran bricklayer, now president of the powerful AFL Building Construction Trades Department, Gray dislikes government paternalism. In paternalism, he sees a threat of socialism, and he's dead set against that.

"American labor, in my opinion, does not look with favor upon this centralizing of power in the hands of non-elective bureaucrats. American labor is for private enterprise from top to bottom—for less government, less regulations and controls, and less taxes," he told the Associated General Contractors at their recent convention in Detroit.

Around the bargaining table he could be rough. He negotiates aggressively on wages and working conditions. He knows the ins-and-outs and all the little strategems of the game. His experience and ability have placed him at the head of the largest single organization in the entire American Federation of Labor. Different role—away from the beginning table is another matter. Gray knows there are problems confronting the industry—labor and management alike. And he believes in doing something about them.

"We of labor are fully aware that more than 3 million building tradesmen . . . . are dependent upon our continued successful operations for earning their livelihood. We will do all within our power to see that your operations are successful and profitable," he told the AGC.

He puts this philosophy into practical action often. Here is a quick summary of his positions on some of the key issues facing the construction industry, as he outlined them in an ENR interview:

• **On the right of judicial review**—Gray has publicly attacked the U. S. Supreme Court ruling in the Wunderlich case. He deplores the decision that findings of the administrative head of a government agency are final regarding questions of fact and that a contractor can have no recourse to the courts unless fraud can be proved. He supports pending legislation to restore the right of contractors to appeal to the courts on findings of fact.

• **On steel construction work**—Gray stands squarely side-by-side with contractors. He is against the Wage Stabilization Board approving a demand of the CIO steel Workers in the basic steel dispute which could be used to shut out contractors and building tradesmen alike from some important construction business.

• **On force account work**—Gray is against it. And where federal and state employes are used on construction jobs, he holds that prevailing wage rates in the construction industry should be paid them for the work they do. Many contractors organizations are fighting the same battle.

• **On wage stabilization**—Gray is opposed to the area rates framework because "it's impractical." "How can a contractor with an important building project in a remote section of the country, attract building tradesmen to work for him under an area rate setup? He's got to compete with rates paid in the nearest sources of supply to attract men—and he can't do this under the area rates set-up," Gray says.

(Continued on next page)

Cover page . . .

The camera caught this informal discussion at the recent convention of the Associated General Contractors in Detroit. Participating are Lester C. Rogers, Bates & Rogers Constr. Corp., Chicago, chairman of the AGC's Labor Committee (left); Richard J. Gray, president of the AFL's Building and Construction Trades Dept. (center); and J. D. Marshall, assisting managing director of the AGC and member of the Construction Industry Stabilization Commission.

Gray seldom passes up a chance to explain his union's policy to builders. Often he seeks out builders groups he feels may have mistaken ideas, to state his position and invite debate.

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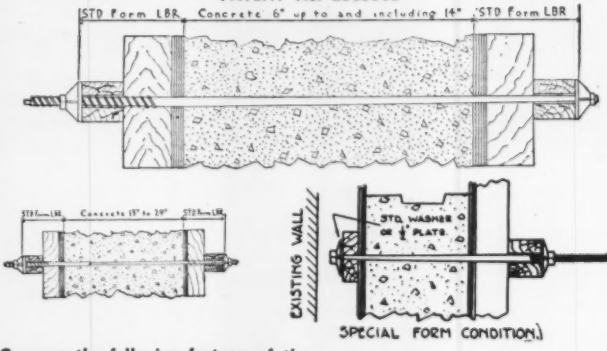
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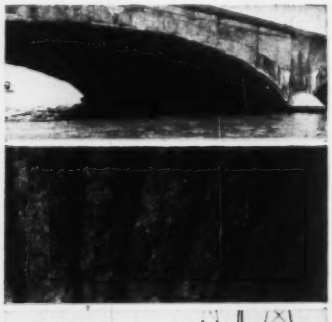

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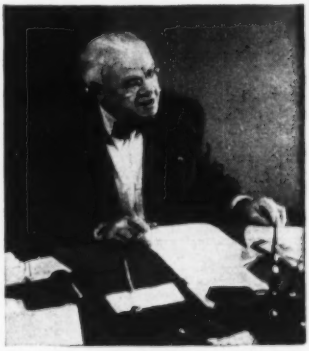

OPPOSES area rates set-up.

• **On jurisdictional disputes**—Gray has joined wholeheartedly with leaders in the various individual building trades and with contractors in setting up the joint board for jurisdictional disputes. Despite a minor altercation between a couple of the trades representatives, the board is still working efficiently to solve dozens of arguments which might otherwise cause stoppages and walkouts.

• **On the controlled materials plan**—He believes a committee of civilian experts on building construction should be set up to screen military requirements for controlled materials, which he says are poorly timed to mesh with construction schedules. Contractors groups have asked for similar scrutiny of stated requirements for metal allotments.

These are the highlights of Gray's intra-industry cooperation program, as he outlined them to ENR. They cover a broad range. They show he means it when he advocates greater unity within the industry as he did at a recent meeting of the Construction Industry Advisory Council to the U. S. Chamber of Commerce. (ENR Feb. 21, p 24).

• **Turn about**—There is evidence that contractors appreciate his cooperation in these matters. For example AGC—representing some 6,100 firms which do most of the nation's contract construction—is giving Gray help with S-1973.

Target for the AFL building trades in the current congressional session is to change Taft-Hartley act election requirements. (ENR Mar 20, p. 42). They want to be able to sign agreements with contracts before work is begun, and also to make a union shop contract requiring membership within seven days of hiring. Taft-Hartley requires a 30-day grace period.

DEPLORES Wunderlich case decision.

They have put these ideas into Senate bill 1973. At congressional hearings, the bill has encountered opposition from certain government agencies, from the CIO and others. But it has the support of the AGC. The AGC has filed a brief which outlines its support of the bill in detail.

• **Bright hope**—So even though the building trades continues litigation in its feud with Brown & Root, Inc. in Texas; and there is no early end in view for strikes and walkouts over local issues—there is a trend toward greater unity in the construction industry today that holds great promise.

In this trend, Gray is a vitally important factor. And from his background training and experience, he knows where he is trying to go.

He was born in Albany, New York, Dec. 6, 1888. After one year of high school, he left to begin his apprenticeship in bricklaying. During the next 20 years he worked as a bricklayer and bricklayer foreman. At nights he took courses in accounting. Then in October, 1927, he became third vice president of the Bricklayer, Masons and Plasterers' International Union. Then treasurer, and in 1936 General Secretary.

Genial and resourceful in council, he won the respect of leaders in the other building trades. He served as vice president and member of the Executive Council of the Building and Construction Trades Department.

On January 1, 1947, he became department president. Since then he has busily forged a new era in building trades policy. His prayer:

"Oh Lord, grant me the serenity to accept what I cannot change, the courage to change the things that I can, and the wisdom to know the difference."

(Continued on next page)

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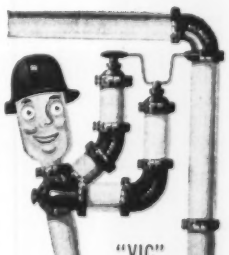

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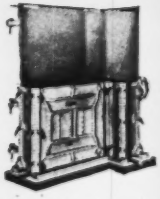

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Labor . . .

Labor board reversed by court

Echoes reached Washington this week of the National Labor Relations Board's decision almost two years ago to reject the "Denham Plan" for waiving both representation and union shop elections in the construction industry and use an area pool. (ENR, June 15, 1950)

The U. S. Circuit Court of Appeals at San Francisco declined to enforce a labor board order directing the Atkinson-Jones joint venture on atomic energy construction at Richland, Wash., to reinstate with back pay an operating engineer who was discharged by Atkinson-Jones four years ago under a closed shop agreement then in effect.

The court's decision hinged on the fact that NLRB had not yet asserted jurisdiction over construction when Atkinson-Jones early in 1948 fired Chester R. Hewes, a member of the International Association of Machinists (Now AFL, but then independent) for failing to maintain payment of his union dues in the AFL operating engineers.

• **Questionable point**—The closed shop contract had been signed with the operating engineer within the 60-day grace period which followed passing of the Taft-Hartley labor law in June 1947.

It was thought questionable only on one point: the contractors employed only ten operating engineers—not a representative number—when the contract was signed with this and 14 other building trades unions at the outset of construction of new facilities needed by AEC at this General Electric-operated installation. That was in August. By the end of the year, there were a total of 740 engineers employed on the job.

The rival machinist's union attacked the contract on technical grounds and backed Hewes' charges.

This case brought NLRB up against the problem of determining union representation rights on construction work. (The union shop poll also was a problem at the time, but is no longer because Congress has dispensed with it as a requirement for making a union shop agreement.)

NLRB, with chairman Paul M. Herzog playing a major part in the decision, rejected Denham's plan. Moreover, it found the Atkinson-Jones closed shop agreement to be invalid because there were not enough engineers on the job at the time it was signed.

PAUL M. HERZOG, chairman NLRB.

It ordered contractors (1) to reinstate Hewes with back pay, (2) to stop recognizing the operating engineers local, No. 370, and (3) to cease interfering with the rights of the machinists to seek bargaining rights for the engineers.

But the court did not say that contractors could, today, act as Atkinson-Jones did in this case. The court did not enforce that part of the order making the contractors stop dealing with the operating engineers because the union has since established itself, and has been certified, as the legal bargaining agent of the operating engineers on this job.

• **Trying again**—NLRB is not giving up. It has asked the court to reconsider and to make the board's order effective from the date of the Ozark Dam Constructors decision in which it took jurisdiction. It's theory is that Atkinson-Jones should, at that time, have corrected the situation as it existed then.

What error Atkinson-Jones may have committed by making an agreement with the building trades craft at the outset of a construction project—a practical necessity to get experienced labor in many areas—would be valid under Senate bill S. 1973 recently approved by the Senate Labor-Management Subcommittee. (ENR, March 20, 1952) It would permit the making of labor agreements covering construction work even before a job is begun. That includes a union shop contract, too.

IVAR PETERSON, new NLRB member.

Ivar Peterson named new NLRB member

There has been a change on the National Labor Relations Board. This week Ivar H. Peterson took his place alongside the other four board members—chairman Paul M. Herzog, John M. Houston, Abe Murdock and Paul L. Styles.

For all employers, this is a loss. The switch signifies further retreat by the administration from support of the Taft-Hartley labor law. Resigned member James J. Reynolds was the only board member who believed in the principles of Taft-Hartley.

Peterson has no personal record on which to base his viewpoint on labor questions. He is 40, was on the staff of NLRB in the Wagner Act days, and calls himself a middle-of-the-roader. However, it is fair to associate his views with those of Sen. Wayne L. Morse, of Oregon, a pro-labor Republican. For since the Taft-Hartley law was under discussion in Congress, he has been an aide of Sen. Morse—until 1948 on loan from the National Association of Broadcasters' legal staff and since then as Sen. Morse's administrative assistant.

As contained in a bill Sen. Morse submitted in March, 1947, when Taft-Hartley was under consideration and Peterson was working with the Senator, these are his views on those subjects:

• **Secondary boycotts**—It would be an unfair labor practice for a union to induce employees to engage in a secondary boycott.

• **Jurisdictional disputes**—If unions did not have their own means of settling jurisdictional disputes, NLRB would appoint an arbitrator.

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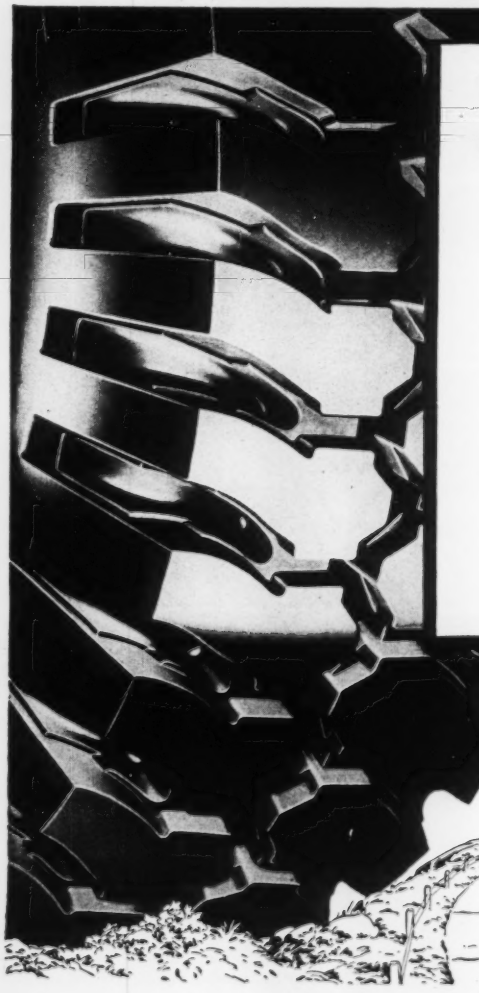

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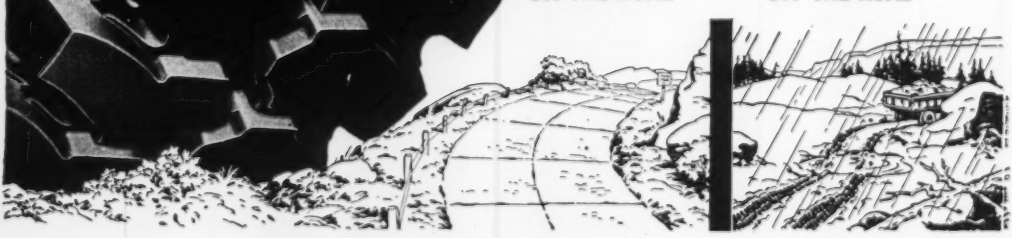

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CLEARED AREA for Magnolia Expressway may be the only area cleared by the Knoxville Planning Commission for an expressway. The contracts had been let for this part of the Magnolia Expressway before the economy-minded administration took over.

Expressway project halted in Knoxville planning fight

Knoxville, Tenn., is having an upheaval in city planning.

Policies of the new city administration which took office last Jan. 1, have resulted in resignation of Planning Commission Chairman George S. Tate, City Planning Engineer Robert C. Stuart and his assistant, George Brenner.

Controversy has developed over various aspects of planning, including the reorganization of the planning setup by Mayor George R. Dempster. Tate has become spokesman for one school of thought; Dempster voices the ideas of the opposing group.

Walter S. Smith, an experienced civil engineer who was retained by the city in 1945 to bring the 1930 Bartholomew city plan up to date, was named to the office of planning engineer, on a fee basis.

The immediate reason for resignations of Tate, Stuart (who holds a masters degree in city planning from North Carolina U.), and Brenner, stemmed from the transfer of the planning staff. Formerly an independent agency responsible to the commission itself, it was put into the Engineering Department under City Engineer Leonard Bailey. New chairman of the planning commission is James E. McDonald, a civil engineer.

• **The issues are:** 1. Whether an expressway or conventional street would be desirable for the city as an east-west arterial. The Planning Commission approved a revised city plan prepared over a three-year period by Stuart. This plan includes a 20-mile system of expressways. The commission strongly advocated expressway construction and defended the Magnolia Avenue Expressway now under construction. The new city administration has condemned expressway construction as impractical and too costly. It favors continuation of the Magnolia Extension as a conventional street when the first link, already under construction, has been completed.

The second point of contention is whether a city planning staff can function more efficiently when directly responsible to the Planning Commission or when it is a branch of the Engineering Department. Mayor Dempster moved the planning staff into the Engineering Department on grounds that closer liaison was needed between planning and engineering and to eliminate another bureau." Tate contended in his letter of resignation that planning would become secondary under this organizational setup and that only an independent operation could be successful.

Third point being debated is whether a civil engineer or a city planner is better qualified to prepare and maintain an overall plan which takes into consideration all factors affecting the future development of a city. Mayor Dempster's position is that "hard-headed, practical engineers" are by virtue of their technical knowledge the better planners; Tate contends that city planners with a wide range of training in all fields affecting city planning are better qualified.

• **Resignations and reasons**—Tate, Stuart and Brenner resigned protesting the planning policies of the administration which came into office Jan. 1 following the defeat of Mayor James W. Elmore Jr. at the polls last November.

There are four civilian seats and Tate's was the fourth resignation. None of the others said publicly their resignations were in protest.

The commission consists of three members of the administration plus four civilian members.

Tate charged in his letter of resignation that the Mayor "by words and action" had shown that he would not "co-operate" with the commission as past administrations had done by giving the commission "responsibilities commensurate with the importance of the many problems of planning which confront a fast growing city."

Tate said that "a city of Knoxville's size must have a separate staff, especially trained in the field of city planning. I cannot agree with your viewpoint that city planning is mostly a matter of civil engineering. . . . Civil engineers are not generally trained to tackle such problems as zoning, population trends, social and economic factors, general aspects of recreation, school systems, land use, traffic movement, and conservation of the residential areas."

Stuart declared that the city administration's planning organization would "create a situation in which there can be no effective constructive city planning."

(*Continued on next page*)

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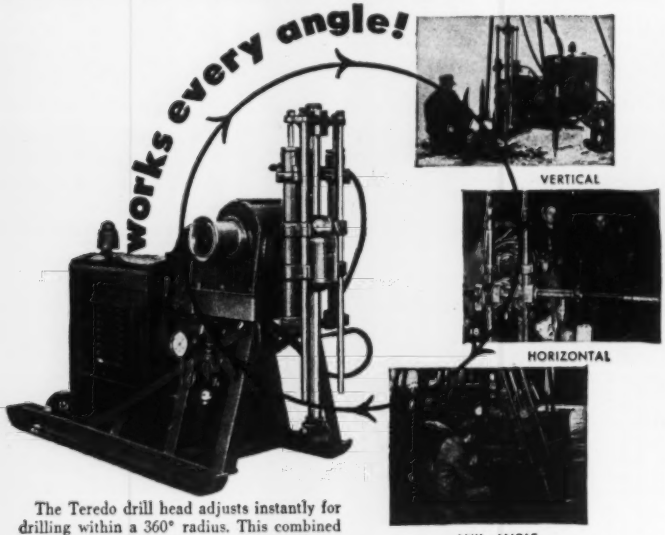

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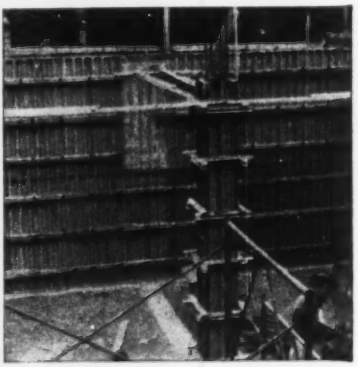

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Municipal . . .

ROBERT C. STUART, city planner who resigned from commission.

• **Stuart out, Smith in**—Stuart, a graduate of Emory University in Atlanta, Ga., completed post graduate work in the Department of City Planning at the University of North Carolina where he received his master's degree. The Knoxville planning position was his first job.

Smith, the civil engineer appointed to the planning engineer's post, has had a wide range of experience in engineering and has been associated with the city on a number of projects. He at one time was city building inspector and at present is consultant engineer on the city's $5.5-million sewage plant project (ENR Feb. 21, p.49).

Mayor Dempster has condemned "starry-eyed dreamers who would bankrupt the city with 20 mi of expressway costing $100 million." This figure has been disputed by expressway supporters. He also said that the city has been damaged by lack of cooperation between the Engineering Department and the planning staff.

City Engineer Leonard Bailey has said that he did not see plans for Magnolia Expressway between the time he saw preliminary drawings and the final plans. Dempster has often referred to this statement by Bailey in support of his contention that the city was not fully acquainted with all aspects of an expressway before agreeing to Magnolia Extension.

The practicality and technical exactness of civil engineers, with their eye for detail, immediate effect and costs, are the vitally needed factors in city planning, Dempster has contended.

• **Magnolia Expressway**—An immediate factor that brought this controversy to a high point was the administration's charge that the Magnolia

WALTER S. SMITH, civil engineer, took over job of city planning engineer.

Expressway, planned during the last administration's tenure by the State Highway Department, was an "engineering monstrosity." This expressway, as planned, would extend some five mi beyond the intersection of Gay Street and Magnolia Avenue.

Plans have been approved for the first mi of the expressway from Gay westward to Unaka St. Construction has begun on one half mi section of this by J. B. Michael Construction Co. of Nashville, Tenn., at a contract cost of $660,000.

The expressway is a federal aid project. Federal and state governments are paying all construction and two-thirds of right-of-way costs; the city is paving one-third of right-of-way costs. Construction began late last year and the first link will be completed late this year, if plans proceed without a hitch.

Estimated cost of the entire expressway when the project was first proposed was put at $5.5 million.

The State Highway Department, at the city's request, is now conducting a resurvey to determine whether the route proposed by the city is more feasible.

Briefly, the city, contending that the state-proposed route entails too much expense, would shoot the thoroughfare along a widened conventional street, Sutherland Ave., a greater part of the way. Tate has said that the present route is least expensive since it runs through "relatively undeveloped property" and pointed out that to extend it out Sutherland would entail purchasing right-of-way through homes and business property.

• Variations on estimates – Mayor

(Continued on next page)

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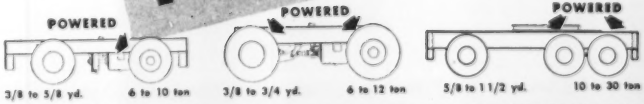

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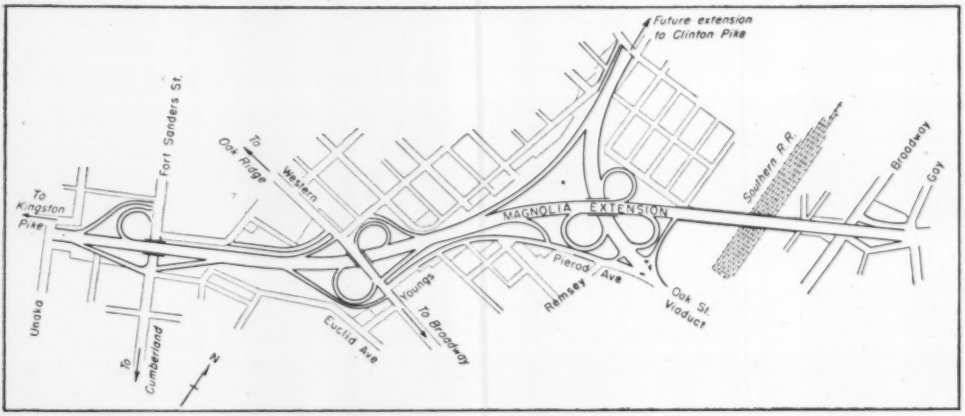

CENTRAL SECTION OF MAGNOLIA EXPRESSWAY now under construction. If the planning commission's new civil engineer led staff goes ahead with its new economy program this section of expressway will have ordinary widened streets at each end.

Municipal . . .

Dempster has contended that an expressway would not be economically feasible. He put the per mi costs at $4.5 million and said the right-of-way would cost $3.1 million based on cost estimates of the link now underway.

"These cost figures," responded Tate in a public statement, "are extremely high." The former planning commission chairman said the estimate was at least $1 million too high, and reported that State Highway Department figures would indicate the per mi cost of the first mi to be nearer $3.5 million. "This will be the most expensive part of the expressway," he said.

• **Traffic data**—Tate declared that the "original decision to make Magnolia Extension an expressway is contained in Chicago engineering firm H. W. Lockner's 1948 Highway and Transportation Plan for Knoxville. The decision was based on traffic counts and traffic flow studies."

The anticipated volume of vehicles over the extension when completed is expected to be between 1500 and 2000, he said, during peak traffic hours. "These traffic volumes are expected to double and perhaps triple, in the next few years, with volume reaching between 3000 and 4500 per hr by 1960 in peak hrs.

The traffic capacity of the widened portion of Magnolia Avenue is only 2400 vehicles, while Magnolia expressway can carry 5000 vehicles per hr, he said.

State Highway Commissioner C. W. Bond strongly advocated expressway construction and declared "it will be built, if the city will give its full cooperation." He said he did not see how a change in construction style could be effected at this late date.

• **Pro**—Supporters of the expressway have also brought out the following points:

The capacity per lane of an expressway is three times that of a conventional street and costs should be figured on that basis.

Five times as many fatalities occur on conventional streets as on expressways.

Increased property values have followed construction of expressways.

An artery such as the Magnolia expressway is needed to avoid choking the central business district with traffic congestion.

• **Con**—Expressway opponents make these claims—

By eliminating pedestrian traffic and cross traffic, as well as parking, commercial value of land along expressway would be cut.

The expressway would obstruct cross-traffic.

• **Plan under study**—Stuart's revised city plan—now under study by the new city planning engineer—outlines a system of expressways that would include the east-west, a north-south, and north-east arterials.

The plan emphasized protection of residential areas with heavily traveled streets routed around these areas and with shopping centers and light industry on these peripheral streets. The plan was designed so that in the distant future an elementary school and playground would be located within a half-mile of each home.

This plan called for a loop road to bypass traffic around the central business district, an inner loop around the retail core, adequate parking and unloading space, and public open spaces for aesthetics.

Housing projects halted by local opposition

Another city has stopped progress on public housing projects in midstream. This time it is Indianapolis, Ind., which voted to kill seven projects, two had reached construction stage. In December it was Los Angeles (ENR Dec. 20, p. 69)

The City Council had authorized the program in the spring of 1951. The federal government advanced $275,000 to the Indianapolis Housing Authority for the program. After six months the council reversed itself, voted 6-3 to halt operations.

Almost immediately the Federal Public Housing Authority warned the city and the local housing authority that it will sue to recover the loans unless the city council backtracks from its position.

• **Boston project under fire**—A $6-million housing project sponsored by the Boston Housing Authority is supposed to occupy a part of Franklin Park, Jamaica Plain. Residents near the proposed site have raised a technical question on the grounds that the park was granted to the Park Dept., under General Laws, for recreational purposes only. Attorney for the people, David Garfinkle, said that it would take a General Court to permit the Park Dept. to use the land for any other purpose.

The city council admitted that it had not consulted the laws when the project was proposed but that they would now inquire into them and decide accordingly.

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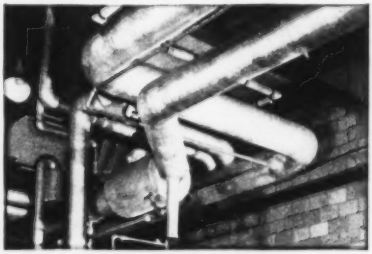
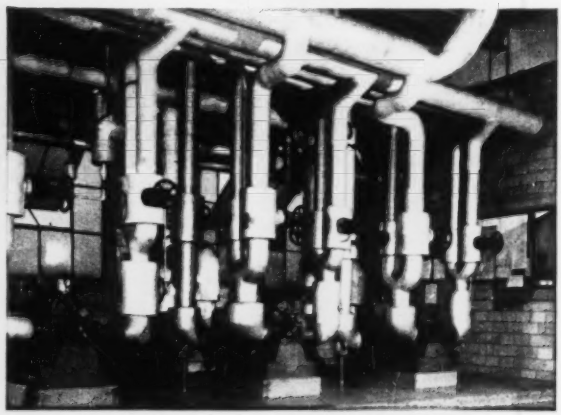
To avoid leakage and downtime for piping repairs, Servel engineers specify the use of TUBE-TURN Welding Fittings and Flanges for all lines 2 inches and up. Thus maintenance expense is cut to the bone. The welded system also conserves space, and provides optimum flow conditions.

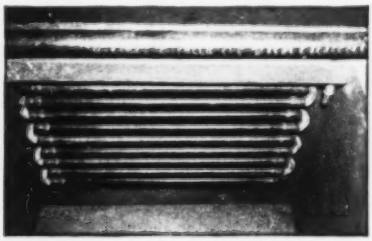
Such efficiency in production services has played a large part in the growth of Servel, Inc., makers of the famous Servel gas and electric refrigerators and a variety of other products.



With no flanges to work around, insulation was easily applied to welded steam lines. Joints will not leak, and insulation will last.

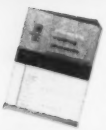


These 2½", 3", 6", and 8" lines for return water pumps and water booster pumps are fabricated with TUBE-TURN Welding Fittings. Close-fitting welded piping is compact and neat.



Steel blanks for cartridge cases are washed in this tank prior to forging operation. Time was saved in tank construction by fabricating heating coils with 1½" TUBE-TURN Welding Returns. Dimensional accuracy assured perfect line-up.

Careful quality control is demonstrated by this spectrographic analysis, made of every TUBE-TURN alloy Welding Fitting before pickling, passivating, and shipping. This check, one of many, assures that user's specifications are met.



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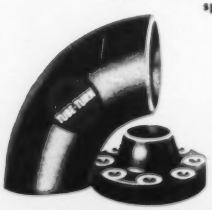

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Municipal . . .

Ohio city faces charges in anti-pollution drive

Officials in Youngstown, Ohio, will answer charges March 29 of breaking the anti-pollution law of Ohio by emptying raw sewage into the Mahoning River.

Youngstown is the first Ohio municipality to be sued by Attorney General C. William O'Neill for failure to treat sewage. If convicted, the city will be liable to a $500 fine. A new suit could be filed each 30 days until the offense was ended. Youngstown is the largst city in Ohio without a sewage treatment plant.

The suit is expected to clear the way for an Ohio Supreme Court decision on whether the Ohio Water Pollution Act of 1951, not yet in effect, superseded previous anti-pollution statutes on the books. O'Neill filed his suit under a 1949 act.

Overhauling sewage system

The $12-million job of completely overhauling the inadequate sewage disposal system of Charleston, W. Va., is expected to get under way this summer.

The task will include construction of a $10-million, ultra-modern disposal plant that would prevent further pollution of the Kanawha and Elk rivers.

The other $2 million would go for additions to the present city-wide drainage system, tying in areas that so far have been deprived of sewer facilities.

Settle Engineering Co., of Charleston, W. Va., is preparing plans for the project.

Municipal Briefs . . .

• **City bids for second place**—City Manager C. A. Harrell asked the San Ontonio, Tex., City Council to annex a one-to-two-mi wide belt surrounding the city and thus make San Antonio the second largest city in Texas. At present Houston is first in size. The annexation would raise the area covered by San Antonio from 70.34 sq mi to 190.74 sq mi and increase the population by 40,000 to 446,811. Harrell wants to annex the territory now and extend sewerage and similar facilities to it later.

• **Water plant planned for Cleveland**—Preliminary plans for a new westerly water plant were submitted to Emil J. Crown, utilities director at Cleveland, Ohio. The plant will have an eventual capacity of 75 mgd of filtered water. A 25-mg reservoir and two new water mains are also included in the plans.

• **Community to build textile plant**—Pending a favorable referendum vote, federal credit approval and the allocation of necessary materials, the community of Lawrenceburg, Tenn., will issue $4.5 million in industrial revenue bonds to build a plant for Wamsutta Mills of New Bedford, Mass. The bonds would be issued under provisions of the industrial revenue bond enacted by the 1951 state legislature. Principal and interest on the bonds are paid out of rentals received from the industry leasing the plant.

• **Go it alone**—Unable to secure Bureau of Public Roads approval for the ventilating system in its proposed $2.2 million Battery St. vehicular tunnel, the City of Seattle, Wash., has determined to build the project without federal aid. The bureau had agreed to pay more than half the cost of the project but insisted that a central ventilating system be installed. The city engineering department designed a decentralized system at a savings of an estimated $500,000. The state highway department approved the city's plan.

• **Tank collapse brings lawsuit**—The city of Tucumcari, N. M., faces a $120,000 damage suit growing out of the collapse of a municipal water tank last Dec. 13, which killed four persons and injured six others. The suit claims that the city was negligent in erecting and using the tank.

• **Shopping center at Oak Ridge**—A $5-million shopping center may be built soon at the atomic energy center of Oak Ridge, Tenn. Its construction depends upon National Production Authority approval. Oak Ridge Properties Corp. will build and operate the area under a 50-year lease from Atomic Energy Commission. These operators will then lease it to approved business tenants. Most of the financial backing is expected to come from major insurance firms.

• **Proposed Seattle bridge**—A $16-million double-deck bridge over an arm of Lake Union has been proposed in Seattle, Wash., by City Engineer R. W. Finke. Upper level of the bridge would be 82 ft wide and carry six lanes of traffic. The lower level, built between supporting girders, would carry two lanes. It would be utilized on a "reversible flow" basis, for south-bound traffic in the morning and north-bound traffic in the afternoon and evening.

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Local funds build New England future

Under the spur of gradual loss of a basic area-wide industry (textiles) New England citizens have been turning rapidly to community-level financing arrangements to provide new factories to hold old industry and attract new enterprises.

The New England area faces a many-pronged problem: The textile industry is again moving out, to areas where labor is cheaper, to be closer to supplies and power; the industry that remains often finds itself hamstrung by obsolete plant and equipment; government is proding industry to decentralize itself. But at the same time, new overseas ore, oil and other raw material sources are emphasizing the advantages of New England seacoast factory locations.

• **Nothing new**—Home-town financing (by the communities themselves or by local industrial foundations) is nothing new in the six-state area. The Keene, N. H., Development Co. and the Danbury, Conn., Industrial Corp. are more than 30 years old.

But more and more New Englanders are waking up to the fact that it takes more than old-fashioned booster salesmanship to attract new firms. Reports from Maine, New Hampshire and Connecticut, where industrial foundations are well along in their programs of financing new factories indicate that this type of financing is becoming recognized as an essential in the area's battle for economic survival and growth.

Maine has foundations in seven cities; New Hampshire in 22; in Connecticut one foundation covers 49 towns in the eastern part of the state.

• **How they work**—Unlike the schemes now being tried in some southern states, and proposed in Rhode Island and elsewhere (ENR Feb. 14, p. 65) where the state or local community pledges its own credit against tax-free bonds to finance such industrial construction work, the New England foundation plans are strictly business, financed by local interests, not by the communities.

Like most other things in the region, the plans are individual, and none can be called typical. Some limit themselves to acquiring sites; some build factories for lease and sale; some give managerial and engineering help; some loan money to business.

Just as individual are the way in which they get their funds. Some solicit stock subscriptions; some promise idividends, others non; some protect their investments with mortgages on buildings or land; many call for widespread public participation.

Generally, private financing is emphasized (although some states offer some financial aid or expert advice); tax exemption is avoided—although some tax abatement are often made to attract industry; local administrative control is a paramount consideration.

The development has another side too—a political side not at first recognized. If the community goes ahead and builds plans—and then doesn't attract industry, it is forced to examine itself closely. And it may find inefficient local government, bad labor relations, marketing patterns and the like, at the root of the failure.

A cleanup is made obvious and necessary.

Maryland plan introduced

Maryland's cities and towns could go into the business of buying or building industrial plants and renting them to private industry under a measure proposed by State Senator Robert Kimble.

The bill would permit incorporated cities and towns to buy or construct such properties within their limits or 10 miles out from their boundaries by issuing 40 year revenue bonds with interest and retirement charges to be met from rentals.

Approval of three-fourths of the majority of voters balloting on the plan would be required before bonds could be issued.

The bonds would not represent municipal indebtedness.

PNYA nets $18.2 million as motor traffic pays

Motor vehicle revenues provided the entire $18.2 million net revenue of the Port of New York Authority for 1951, despite losses on operations of airports and other facilities, according to the agency's annual report.

The bi-state (New York-New Jersey) authority reported a gross operating revenue of $50.3 million for the year, 19% higher than 1950. Although this gross revenue represented gains in operation of the four airports under its wing, PNYA said its net loss on the airports was $578,904. (Officials declined to comment on the effect of closing Newark airport, after a series of take off crashes had brought heavy public criticism of operation of the port.)

The stars of the PNYA show for the year were the two tunnels (Holland and Lincoln) and three bridges (George Washington, Bayonne, Outerbridge and Goethals), which together turned in a gross revenue of $35.5 million. The six facilities carried 13.7 percent more traffic in 1951 than in 1950, although some of it traveled on new "commutation" tickets, thus cutting into the total revenue.

Homebuilders push for end of controls

Encouraged by recent announcements aimed at easing controls on construction generally, homebuilders last week pushed further in their demands for relief from restrictions.

Their fire was aimed particularly at credit controls, which Alan E. Brockbank, president of the National Association of Home Builders, said are preventing low-income families from buying homes.

Testifying before the Senate Banking and Currency Committee, the NAHB chief said that heavy cash down payments required under present credit controls, plus shrinking of mortgage markets are the main deterrents to more homebuilding.

Finance briefs . . .

• **OK Chicago bonds**—A bond issue of $2.6 million to finance an addition to the Riverside-Brookfield high school, west of Chicago, Ill., was approved by voters. The structure is to include a gymnasium, swimming pool, classrooms and an auditorium.

• **More work for Fannie Mae**—Legislation to permit the Federal National Mortgage Association (Fannie Mae) to guarantee mortgages on 37 additional defense and military housing projects in 17 states has been introduced in the Senate. It would increase by $52 million the amount FNMA is allowed to commit in advance for purchasing mortgages on programmed housing. Present limit for such commitment is $200 million.

• **Bonds up for university work**—Construction bonds to finance is $1.3 million student-faculty center at the University of Tennessee will be ready for bids about April 15.

Which will it be on your next bid?

Quite often, a job goes for the difference in a bid made possible by low, *preferred* bond rates. Can you meet or beat competition on this vital point?

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Powerplant, Fla.

Work began March 16 on the final stage of construction of the Jim Woodruff Dam near Chattahoochee, Fla. The contract for the gated spillway, powerhouse and switchyard was awarded for the low bid of $13,907,380 to a combination of four contractors, Perini, Walsh, Mills and Blythe Bros. also contractors for the lock and fixed-crest spillway. Erik Floor & Associates, Inc., Chicago, Ill. are the consulting engineers. Work is under the supervision of the Mobile District of the Corps of Engineers.

The Jim Woodruff Dam is being built across the Apachicola River just below the confluence of the Flint and Chattahoochee Rivers, providing a 9 x 100-ft navigation channel and hydrolectric power.

Unit prices are shown here on intrusion cofferdam grouting described in ENR July 7, 1950, and June 14, 1951. Grouting is of prime importance in the construction as the usual cofferdam and well-point control of water is not sufficient and a grout curtain is needed in the porous Tampa limestone under the cofferdam. Prepakt Concrete Co., Cleveland, Ohio has a sub-contract for the two patented products, intrusion and alfesil, in the admixtures of the grout, which is used in conjunction with portland cement and sand to grout the foundation. The preexcavation grouting operation is believed to be the first such application of the use of this type of grout.

The Government will furnish these items: steel sheet piling, steel reinforcing, all powerhouse electric equipment, all radio communication equipment, switchyard supporting structures, draft tube gantry crane and hoist follower, overhead power house crane and trolley, gantry cranes for spillway and intake gates, and all machine shop equipment. All generators and electric elevators and accessories will be government furnished and installed.

Minimum wage rates range from $.85 an hour for common labor to $2.50 an hour for skilled labor. The job is set up to be completed in 1000 calendar days and liquidated damages are set at $500 per day. The entire project should be complete in November, 1955.

Bidders include:

1C **B. Perini & Sons, Inc., Framingham, Mass.; Walsh Construction Co., Davenport, Iowa; Ralph E. Mills Co., Inc., Frankfort, Ky.; & Blythe Bros. Co. Inc., Charlotte, N. C.** $13,907,380

2 **Chas. H. Tomkins Co., Washington, D. C. & J. A. Jones Construction Co, Inc., Charlotte, N. C.** $14,336,941

3 **Winston Bros. Co., Monrovia, Calif.; Foley Bros. Inc. St. Paul, Minn.; Donovan Construction Co., St. Paul, Minn.; & C. F. Lytle Co., Sioux City, Iowa** $14,828,824

Gated Spillway

Bids: 1-16-52 Items	Unit	Quantity	Unit prices 1 C	2
Cofferdam prot for 1st stg const dam	ls	1	$550,000	$442,338
Pump from prot area 1st stg const dam	M gal	323,000	$0.40	$0.10
Clearing	ls	1	$150,000	$76,840
Grubbing	ac	16	1,000	256
Stripping	cy	18,800	$1.00	$0.51
Excavation; channel	cy	902,800	0.65	0.61
Unclass	cy	154,300	3.00	2.05
Explor	cy	10,500	15.00	12.81
Impervious borrow	cy	401,800	0.50	0.62
Pervious borrow	cy	665,600	0.50	0.55
Foundation prep	sf	89,300	0.50	0.77
Compacted fill	cy	763,600	0.12	0.15
Add rolling compact of fill	sy	10,000	0.25	0.32
Explor holes, 1½" percuss-drilled	lf	6,000	0.80	1.28
Explor holes, 4⅞" core-drilled	lf	700	10.00	12.80
Pipe, bl st, Grout, 2½" dia	lf	6,100	2.75	2.56
Grout pipe assem	ea	144	15.00	13.00
Uplift indication pipe assem	ea	25	30.00	20.00
Drill 1⅞" cofferdam grout holes	lf	4,500	5.00	6.40
Drill 1⅞" curt gr hole				
0 to 15,000	lf	15,000	2.75	3.50
15,000 to 30,000	lf	15,000	2.80	3.20
30,000 & over	lf	10,500	3.00	3.20
P cmt for found grout				
0 to 50,000	sk	50,000	2.10	2.56
50,000 to 100,000	sk	50,000	2.15	2.05
100,000 & over	sk	25,000	2.50	1.90
Sand for found grout				
0 to 100,000	cf	100,000	0.65	1.00
100,000 to 200,000	cf	100,000	0.65	0.77
200,000 & over	cf	90,000	0.65	0.64
Flyash 0 to 25,000		25,000	1.75	2.00
25,000 to 50,000	sk	25,000	1.75	1.90
50,000 & over	sk	9,000	1.75	1.90
Fluidifier 0 to 80,000	lb	80,000	0.25	0.28
80,000 to 160,000	lb	80,000	0.25	0.28
160,000 & over	lb	36,000	0.25	0.28
Rem obj mat from belo fndn grd by wash	hr	1,000	7.50	19.20
Filter material	cy	8,500	10.00	7.95
Riprap	cy	25,800	15.00	9.85
Mortar to gr riprap cmt	sk	37,700	3.00	2.88
Concrete in apron	cy	4,900	23.00	21.15
in piers	cy	13,300	35.00	30.40
in sill	cy	50,200	18.00	18.57
in recesses	cy	85	100.00	31.00
Misc exter conc	cy	300	100.00	64.00
Portland cmt	bbl	58,000	3.50	4.74
Steel reinf fab & pl	lb	568,600	0.05	0.064
Copper water stops	lf	1,730	3.50	3.84
Spillway, gates, guides & appurt	ls	1	$1,000,000	$1,273,000
Serv bri at fra & deck	ls	1	215,000	230,519
Handrailing	lf	2,750	$5.00	$4.95
Air vent pipes	lf	930	10.00	14.50
Corr met pipe, 8" perf	lf	740	4.00	3.85
8"	lf	250	5.00	5.12
Misc steel	lb	2,680	0.75	0.51
Galv	lb	6,220	0.85	0.65
Asphaltic conc	cy	60	60.00	64.00
2" water line	ls	1	$2,000	$1,413
Steel cond & ftgs	lb	16,780	$0.65	$0.95
Asb-cmt cond & ftgs	lb	60,230	0.50	0.40
Ins wire & cable				
#8 & smaller	lb	210	3.30	2.20
#6 & larger	lb	10,220	1.70	1.60
Bare cpr wires, cbls, bars, shps, ftgs & pls for cl ris & grd sys	lb	15,850	2.30	2.40
Misc elec work	ls	1	$22,000	$44,627
Embank grav base crs	cy	1,520	$5.00	$8.95
Sand-cla base & bit surf crs	sy	13,400	3.00	2.30
Guard fence	lf	800	3.50	3.07
Switchyard fence	lf	700	6.00	5.64
Drain pipe 4"	lf	230	2.50	2.90
6"	lf	16	3.50	4.00
8"	lf	126	4.00	5.00
12"	lf	90	5.00	4.90
15"	lf	100	6.00	5.76
18"	lf	100	7.00	7.04
21"	lf	180	12.00	7.70
6" perf	lf	850	4.00	3.20
Catch basins	ea	8	300.00	384.00
Switchyd grav surf	cy	770	9.00	9.00
Topsoil plant	sy	500	1.50	1.28
Lock stop logs & pickup beam assem	ls	1	$200,000	$204,906
Guard rail	lf	6,100	$3.00	$3.46
Water supply line	lf	5,600	4.10	4.80
Soil line 4"	lf	42	5.00	13.00
Bit coated C M dr pipe 12"	lf	10	5.00	9.00
12" perf	lf	170	6.00	10.20
Apron dowel fab & pl	lb	19,700	0.75	0.26

Powerhouse and switchyard

Bids: 1-16-52 Items	Unit	Quantity	Unit prices 1 C	2
Cofferdam prot for 2nd stg const powerhouse	ls	1	$500,000	$707,344
Pumping from prot area for 2nd stg const powerhouse	M gal	302,000	0.40	0.10
Excavation, unclass	cy	117,000	3.00	1.92
Explor	cy	7,800	15.00	12.80
Foundation prep	sf	66,400	0.50	0.77
Explor holes, 1½" percuss-drilled	lf	2,000	0.80	1.28
Explor holes 4⅞" core-drilled	lf	300	10.00	12.80
Pipe, bl, stl, grtg 2½"	lf	3,900	2.75	2.56
Grout pipe assembly	ea	51	15.00	13.00
Drilling 1⅞" coffer gr holes	lf	6,600	5.00	6.40
curt gr holes 0 to 10,000	lf	10,000	2.75	3.50
10,000 & over	lf	3,400	4.50	3.20
Drilling 3" weep holes in draft tube flr	lf	4,600	5.50	3.20
Port cmt for fndn gr 0 to 20,000	sk	20,000	2.10	2.00
20,000 to 40,000	sk	20,000	2.15	1.90
40,000 & over	sk	4,000	3.00	1.90
Sand for fndn gr. 0 to 50,000	cf	50,000	0.65	1.02
50,000 to 100,000	cf	50,000	0.65	0.77
100,000 & over	cf	1,000	0.65	1.15
Flyash 0 to 10,000	sk	10,000	1.75	2.56
10,000 to 20,000	sk	10,000	1.75	1.92
20,000 & over	sk	1,000	1.75	1.92
Fluidifier 0 to 30,000	lb	30,000	0.25	0.28
30,000 to 60,000	lb	30,000	0.25	0.28
60,000 & over	lb	9,000	0.25	0.28
Rem obj mat from belo fndn grd by wash	hr	740	7.50	19.20
Conc, thin walls & slabs	cy	3,800	75.00	57.63
Conc, mass & thick wall & slabs	cy	90,200	21.00	23.05
Conc, in recesses	cy	70	150.00	51.20
Porous conc	cy	30	75.00	38.40
Portland cement	bbl	107,000	3.50	4.74
Separate conc flr fin	sf	16,000	0.75	0.34
Ground conc flr fin	sf	9,000	1.50	1.28
Steel reinf f & p	lb	2,202,480	0.12	0.1216
cutg & pl	lb	231,520	0.05	0.064
Copper water stops	lf	4,800	3.50	3.84
Struct steel	lb	676,000	0.14	0.19
Powerhouse bldg	ls	1	$425,000	$350,000
Intake gates & guides	ls	1	260,000	298,394
Draft tube gts & gids	ls		63,000	69,156
Trash racks & gids	ls	1	108,000	111,418
Heat, vent & air cond	ls	1	116,500	181,721
San & fr water sys	ls	1	39,000	41,639
Raw water piping	ls	1	34,500	53,793
Unwat & drain sys	ls	1	43,000	59,281
Air piping	ls	1	8,000	6,360
Oil piping sys	ls	1	9,100	10,569
Hydraulic gage piping	ls	1	7,600	4,103
Unwatering pumps	ls	1	18,500	29,358
Oil purification equip	ls	1	26,700	49,818
Compressed air equip	ls	1	16,000	32,051
Fire protection equip	ls	1	5,300	8,050
Water pumps	ls	1	2,900	3,546
Sewage treat equip	ls	1	14,300	20,777
Inst pwr hse elec equip	ls	1	38,000	72,580
Stl cond & ftgs	lb	54,300	$0.72	$0.92
Al cond & ftgs	lb	700	1.40	2.11
Asb cmt cond & ftgs	lb	700	0.60	0.44
Flexible stl cond	lb	170	1.10	2.00
Grounding system	lb	11,100	2.10	2.22
Ins lighting wire, 0-600 V, all sizes	lb	2,200	3.10	2.14
Ins pwr wire, 0-600 V, #8 AWG & larger	lb	10,800	2.20	1.58
Ins pwr wire, 601-1000 V, #10 & small	lb	1,900	2.75	2.41
Ins control wire, 601-1000 V, all sizes	lb	9,400	3.70	2.50
Ins wire, 14001-15000 V all sizes	lb	17,100	1.90	2.36
Potheads at gentrs 15 Kv	ls	1	$7,200	$4,073
Lighting systems	ls	1	45,000	37,281
Strtg & control equip	ls	1	2,500	3,910
Tel & code call sys	ls	1	5,500	10,774
Electric clock	ls	1	450	471
Cbl trays, rks, & spt	ls	1	20,000	24,018
Radio comm sys	ls	1	2,000	5,103
Inst switchyd equip	ls	1	42,000	61,137
Switchyd busses & overhd grnd wires	ls	1	7,000	19,095
Underground duct sys	ls	1	16,500	17,247
Inst turbines	ls	1	160,000	166,486
governors	ls	1	12,000	19,210
pwr hse crane	ls	1	17,500	14,087
drf tube gantry crane & hoist follwr	ls	1	5,000	6,403
splwy & intk gan crn	ls	1	45,000	32,017
Setting trash rack rake & car	ls	1	1,000	768
Inst CO₂ equip	ls	1	9,500	11,436
mach shop equip	ls	1	3,500	2,946
elec mch rm sppt beams & rail spots	ls	1	4,500	768
gentr fndn bolts & sole plates	ls	1	6,500	15,368
Unidg & strg operators	ls	1	37,500	28,174
Transformer transfer track flr		410	$20.00	$25.60
Transfer car	ls	1	1,200	6,403
Well & pump	ls	1	9,000	7,958

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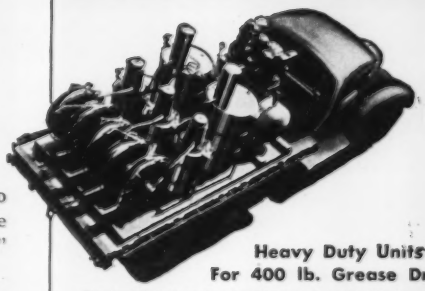

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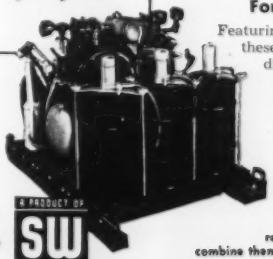
Standard Duty Units For 100 lb. Grease Drums

Featuring the famous Alemite "Atomic" Pump, these units deliver lubricant direct from 100 lb. drums. Consist of pumps, up to five reels, delivery hose and air compressor. The matching steel bases can be fastened together with side rails . . . mounted on a small truck or trailer and quickly driven from place to place.



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Modern projects such as the new Norfolk (Va.) Airport Building illustrate the architectural distinction and the operating efficiency possible with Truscon Steel Building Products. From one single source, Architect Vernon A. Moore was able to specify and secure delivery on Truscon Series 46 Double-Hung Steel Windows, Truscon Architectural Projected Steel Windows, Truscon Intermediate Steel Windows, Truscon Donovan Steel Windows, Truscon "O-T" Steel Joists, and Truscon Steeldeck Roofing. Doyle and Russell, Contractors, erected this magnificent new structure.

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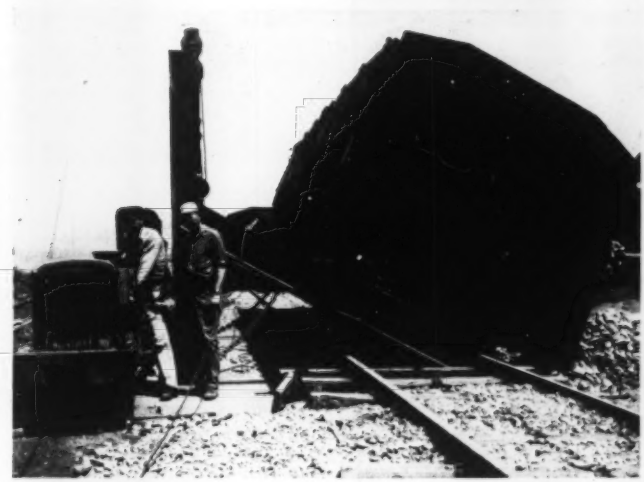
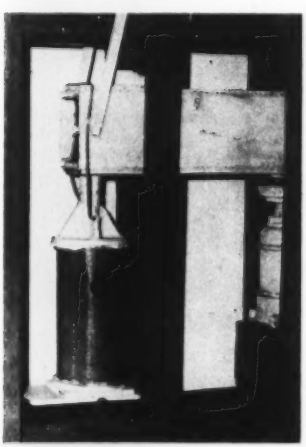


CAR DUMPER uses track section that tilts 35 degrees.

Seabees lacking tools devise their own

Here are two more instances where Seabees in Japan ran up against obstacles and improvised. The first instance is a concrete testing machine with pressure enough to break 6x12-in. concrete cylinders. The second is a railroad car dumper built of scrap materials which dumps 100 cars in an 8-hour day.

Wharf design for a project at an undisclosed location in Japan called for 3,000 psi concrete for piles and deck structure. Local laboratory conditions were uncertain so a testing machine was made from scrap and borrowed material.



TESTING MACHINE made of available 20-ton jack and borrowed gage.

A 20-ton hydraulic jack came from the battalion's transportation shop; a 5,000 psi hydraulic aircraft gage was donated by the local Fleet Aircraft Service Squadron; the Squadron machine shop turned out a universal head, bearing plates, and pivots; scrap piles yielded up steel plate and channels. With these ingredients the ingenious Navy men set to work.

A 4 to 1 lever system was devised to develop enough pressure to break the concrete cylinders. Pressure was transferred from the hydraulic jack by means of a box-section beam pivoted at the jack by a pin, and at the bearing point by a ball-and-socket head. Another pin joint visible below the cylinder bearing allowed for lateral motion of the fulcrum action. (In the accompanying photo the 4-to-1 fulcrum pin has been removed temporarily.) The gage measures pressure in the pump cylinder, from which the pressure on the concrete is calculated. Cylinder pressure is only approximate since the machine has not been calibrated. Friction losses and application of load both cause some variations, but a working relationship has been established by comparison of breaking values.

For the materials handling problem the Seabees ingenuity came in stages.

(Continued on p. 58)

SAUERMAN
CRESCENT SCRAPER

● Picture shows Sauerman Crescent Scraper hauling 5-ton load of gravel to hopper feeding to screening plant.

ON THOUSANDS of earthmoving jobs, Sauerman Scraper machines equipped with the unique Crescent bottomless bucket, are cutting costs in digging, hauling and dumping almost every kind of material.

A Crescent bucket penetrates tough materials with ease, gets a full load quickly, hauls this load at speed of 400 f.p.m., dumps automatically wherever operator desires —all with economical use of power.

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MASONITE CONCRETE FORM PRESDWOOD
Saves Big Dollars on the Big Jobs!

At Bull Shoals it was only natural for the builder to use Masonite Concrete Form Presdwood®—*to the tune of 14 carloads.* These super-smooth, all-wood panels leave no wood-grain impression. They can't—they have no grain or knots. Virtually eliminate time-consuming, labor-wasting hand rubbing.

Here's what the Contractor Says:

OZARK DAM CONSTRUCTORS
BUILDERS OF
BULL SHOALS DAM AND POWERHOUSE
MOUNTAIN HOME, ARK.
December 13, 1951.

Masonite Corporation,
111 West Washington Ave.,
Chicago, Illinois.

Attn: Mr. T. H. Gaskin.

Gentlemen:

We have used fourteen (14) carloads of Masonite Concrete Form Presdwood during the construction of Bull Shoals Dam and Powerhouse.

This will give you some idea of how well satisfied we are with your product. And I want to thank you for the prompt and efficient way you have handled our orders.

Very truly yours,

OZARK DAM CONSTRUCTORS

H. H. Sloan,
Project Superintendent.

HHSloan

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- Saves form lumber costs.
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Better Hardboards for Better Building

(*Continued from p. 57*)

The first rail shipment of crushed rock was unloaded by using 100 Japanese laborers who shoveled the rock from railroad cars into trucks. With the arrival of the battalion's equipment a clamshell was put into operation unloading the rock. As additional cars began to arrive loaded with river-run gravel for subgrade stabilization the clamshell proved incapable of unloading the daily quota.

The next modification was a dozer blade rigged up so that it could be suspended from the ¾-yd crane like a dragline bucket. With both sides of the railroad car dropped, the blade was dragged across the car sweeping gravel before it.

All went well until the battalion's 120-ton-per-hour rock crusher was installed, requiring the daily handling of 100 carloads of rock. With current combinations inadequate, the personnel drew on their collective accumulation of construction experience and came up with car dumper pictured.

A site was chosen on a rail spur; a section of track the length of one railroad car was cut away; a slab of concrete 18 in. thick was poured in the cut-away section. In the slab was embedded a framework of 12-in. steel I-beams with protruding eyes at the end of the transverse beams along one side of the track section. These were hinged to similar eyes in protruding framework below.

Two I-beams were embedded vertically in concrete to provide stanchions from which three-part wire rope tackles were suspended for lifting the unhinged side of the track section. A GMC truck, reclaimed from a scrap heap and stripped of everything except front winch. Two other winches, driven by the two rear drive shafts, supplied power for tilting the entire track section 35 deg. A loaded car is towed by the front winch onto the tilting track section. The frame of the car is fastened to the track support frame with a special clamp to prevent the car from tipping off the tracks when the loader is tilted. The two rear winches are engaged after the side of the car has been dropped, and the entire car and track section then are tilted so that all the rock spills from the car into the receiving bin of the sunken hopper. Winches are then reversed and the car gently lowered back to level.

A complete unloading cycle requires the efforts of three men for 5 min. Seabee ingenuity and scrap material have thus released valuable machinery and an army of small laborers for other duties. One hundred cars can easily be emptied in an 8-hr day. (USN-CEC Photos)

Railroads face continued shortage of engineers and car-building materials

Two vital problems facing the railroads today—a shortage of technical manpower and inability to get sufficient car-building materials—are no nearer to solution now than they were a year ago. In fact, they are worse. These discouraging facts were presented at the American Railway Engineering Association's 51st annual meeting held last week in Chicago.

This time last year some lines were just beginning to feel the pinch of the engineer shortage, while the industry as a whole expected to get enough steel to build 10,000 freight cars per month (ENR Mar 22, 1951, p. 16).

From a paper prepared by J. H. Aydelott, vice-president, Association of American Railroads—and presented to the 1,650 in attendance at the three-day meeting by T. A. Blair, chief engineer of the Santa Fe Railroad—they learned that:

Early allocation of sufficient steel and other materials for the manufacture of 100,000 freight cars now on order by the railroads is a "must" for both our national economy and defense programs. Instead, steel allocations have been curtailed to a point where volume of new car building for the remainder of 1952 will be barely sufficient to replace worn-out cars retired from service.

"Paradoxically," said Aydelott, "after expanding its capacity to meet the needs of the mobilization program, the steel industry may encounter serious delays in shipments by reason of a car shortage."

Little hope was held out for early improvement of the technical manpower shortage, by O. W. Eshbach, dean of engineering, Northwestern University. "The shortage of college trained engineers is so acute," said he, "that in spite of a record graduating class last year, industry could have placed twice the number available. Moreover, industry could use three or four times the smaller number of engineers graduating this spring."

In general, said Eshbach, the railroads face the same critical shortage of engineers as industry. Although they are attempting to stimulate the recruitment of engineers into the railroad fields—by publicizing the science of transportation and its importance in the national economic structure, and by cooperating in an educational program that allows summer employment—the supply of technical manpower continues to be stringent.

C. J. GEYER, new president, went with the Chesapeake & Ohio Ry. in 1908 as a rodman, and, progressively, was instrumentman, 1910; assistant engineer, system, 1914; division engineer, 1918; assistant to vice-president, 1929; general manager, 1943; assistant vice-president, 1947; and vice-president, construction and maintenance, 1949.

Dean Eshbach estimates that by 1962 the number of engineering graduates will be 40% more than this year. By 1967 this number should increase to 65%, but it will take 20 years before supply reaches a level comparable to that of the scientific and technical activity in this country, said he.

• **Broader horizons**—Opportunities unlimited are facing engineers today, said Fred G. Gurley, president, Santa Fe System Lines, in a stimulating talk stressing the fact that engineers should "do more and do it better."

"No longer can engineers confine their activities solely to design, construction and maintenance," declared Gurley, "theirs must be a broader outlook. Both management and the

(Continued on next page)

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Meetings . . .

engineers themselves have mistaken concepts of where the engineer fits into the picture."

"Engineers should concern themselves more with administration," warned Gurley. "Their logical technological reasoning can help improve the economical operation of railroads; reduce the damage to property being shipped; and develop more revenue-paying business now going to competitive forms of transportation."

In this latter connection, Gurley advocated the establishment within the AREA of a Committee on Research of Competitive Transportation. And he urged the AREA members to turn their trained minds to the evaluation of the facts that are behind the erosion process of freedom, thus helping arrest the present "trend to statism."

• **Expanded research**—A record budget of $380,000 has been approved by the Association of American Railroads for research during 1952. It includes 32 research projects, said G. M. Magee, research engineer, AAR, covering almost every phase of railway engineering.

One such project, recently completed over a three-year period at Purdue University, showed that the most effective waterproofing coatings for concrete are ordinary pigment-in-oil house paint, linseed oil and caulking mastic. Results of another research project show that no railroad ties of substitute materials have been found that can compete—either in first cost or annual depreciation—with fully pressure-treated wood ties.

• **New officers**—Charles J. Gever, vice-president in charge of construction and maintenance, Chesapeake and Ohio Railway, was elected president of AREA, succeeding Tom A. Blair, chief engineer, Atchison, Topeka and Santa Fe Railway. Charles G. Grove, chief engineer maintenance of way, Western Region of the Pennsylvania Railroad, was elected senior vice-president, and G. W. Miller, engineer maintenance of way, Eastern Region of the Canadian Pacific Railway, was elected junior vice-president.

Appraisal groups join in new organization

Plans for an amalgamation of two technical societies concerned with appraisal and valuation into a single American Society of Appraisers were reported publicly last week.

The membership of the new group will comprise specialists in valuation of buildings, land, valuation for rate-making purposes, tax assessments and the like, and appraisal of machinery, and equipment.

The two organizations that will merge are the American Society of Technical Appraisers, and the Technical Valuation Society, which together have 16 active chapters in key cities in the United States.

TOM BLAIR, chief engineer of the Santa Fe R.R., conducted the general sessions of the AREA meeting.

Sanitation efforts reach point of stabilization

Sixteen years' work cleaning up waters of New York, New Jersey and Connecticut has brought the Interstate Sanitary Commission to a point where the end of sewage pollution is in view. By mid-1954 there will be practically no raw sewage in any Class A (recreational) waters of its area, said Seth G. Hess, ISC's director and chief engineer, at the recent New Jersey Sewage and Industrial Wastes Association meeting in Atlantic City.

Commission activities have come to a point of stabilization, said Hess. The next step is to get after inadequate plants; a program of modernization is about to get under way. Modification of standards, upwards, is a possibility now, although no official consideration has yet been given such a move by the commission. The commission's recognition of investments already made in pollution abatement will preclude radical changes.

Meanwhile, work on ISC's inventory of industrial wastes continues (ENR Dec. 13, 1951, p 76).

Officers elected to 1952-53 terms in the N. J. Sewage and Industrial Wastes Association were: Sol Seid, president; John W. Hood, 1st vice-president; John Collom, 2d vice-pres.

IN HAMILTON, ONTARIO—The problem was to install seven miles of 48" line, fast, to meet the terrific demands of the city's rapidly expanding industrial and residential areas. A $1,900,000 job, including the filtration plant. With confidence, Hamilton engineers specified a Dresser-Coupled steel line.

A DRESSER-COUPLED STEEL LINE delivers water cheaper

The cheapest way to pipe water to where it turns into revenue is with a Dresser-Coupled steel line—the line that cuts *installation* costs, *leakage* losses and *maintenance* expense.

As in the case of this Hamilton line, existing pipe networks often seriously complicate the installation of new mains. Lighter, easier-handled steel pipe joined with Dresser Couplings—simpler to make up, even in cramped ditches—provides the swiftest, most practical way of getting under or around underground obstacles. The line is completed quicker—starts paying its way sooner.

Leakage losses are eliminated. *Controlled gasket pressure*, provided by the bolting up process in a Dresser Coupling, is your assurance of the correct *sealing* pressure all around the joint. Resilient Dresser gaskets absorb stresses from vibration, contraction and expansion, yet keep the joint "flexible-tight".

Maintenance is cut to the bone, too. Dresser Couplings last for life, and the absence of heat in joining prevents damage to glass-smooth pipe linings. High carrying capacity is sustained.

Experience all over the world proves that a Dresser-Coupled steel line gives you the ultimate in performance and economy. See your Dresser Sales Engineer or write our Bradford Office for detailed information.

Be Sure you get the best line at the best price. Put steel pipe and Dresser Couplings in your specifications.

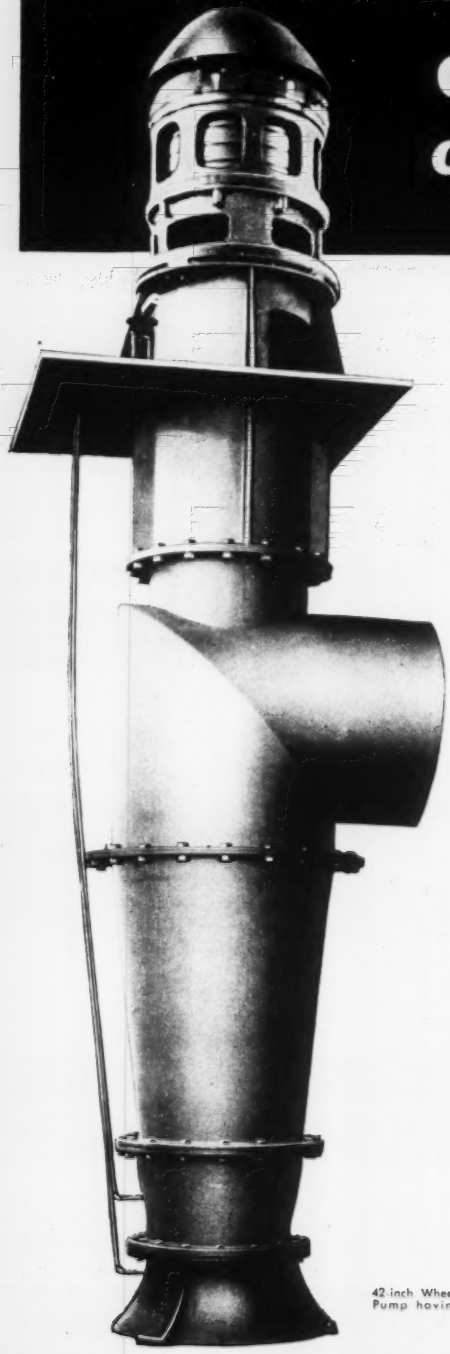
DRESSER

"FLEXIBLE-TIGHT"

COUPLINGS

Dresser Manufacturing Division, 59 Fisher Ave., Bradford, Pa. (One of the Dresser Industries). Warehouses: 1121 Rothwell St., Houston, Texas; 101 S. Bayshore Highway, South San Francisco, California. Sales Offices: New York, Philadelphia, Chicago, Houston, South San Francisco. In Canada: 629 Adelaide St., W., Toronto, Ont.

C. H. WHEELER & CONSOLIDATE TO



42-inch Wheeler-Economy Vertical Axial Flow Pump having capacity of 40,000 G.P.M.

Economy Pumps, Inc. and C. H. Wheeler Manufacturing Company have consolidated engineering and manufacturing facilities in C. H. Wheeler's plant at Philadelphia. Facilities are now being expanded through new construction and the installation of additional modern machine tool equipment.

PUMPS . . . Economy has for many years been among the leaders in the engineering and manufacture of centrifugal, axial and mixed flow pumps. Today, the Wheeler-Economy line is one of the most modern and complete in the pumping industry.

CONDENSERS & POWER PLANT EQUIPMENT . . . The C. H. Wheeler Manufacturing Company has contributed many of the outstanding developments in the field of condensing apparatus and vacuum problems. Nearly a decade ago, C. H. Wheeler adopted Economy mixed flow pumps for use with their condensers.

PROCESS EQUIPMENT . . . C. H. Wheeler is also internationally known for Cooling Towers, Steam Jet vacuum apparatus and Fine Particle Reduction Mills, vital links in modern chemical and food processes. Wheeler-Economy Pumps will round out the company's services in these fields.

MARINE GEAR . . . C. H. Wheeler's Marine Gear, Condenser and Deck Machinery department will be augmented by Wheeler-Economy Pumps designed for marine application.

ECONOMY PUMPS, Inc.

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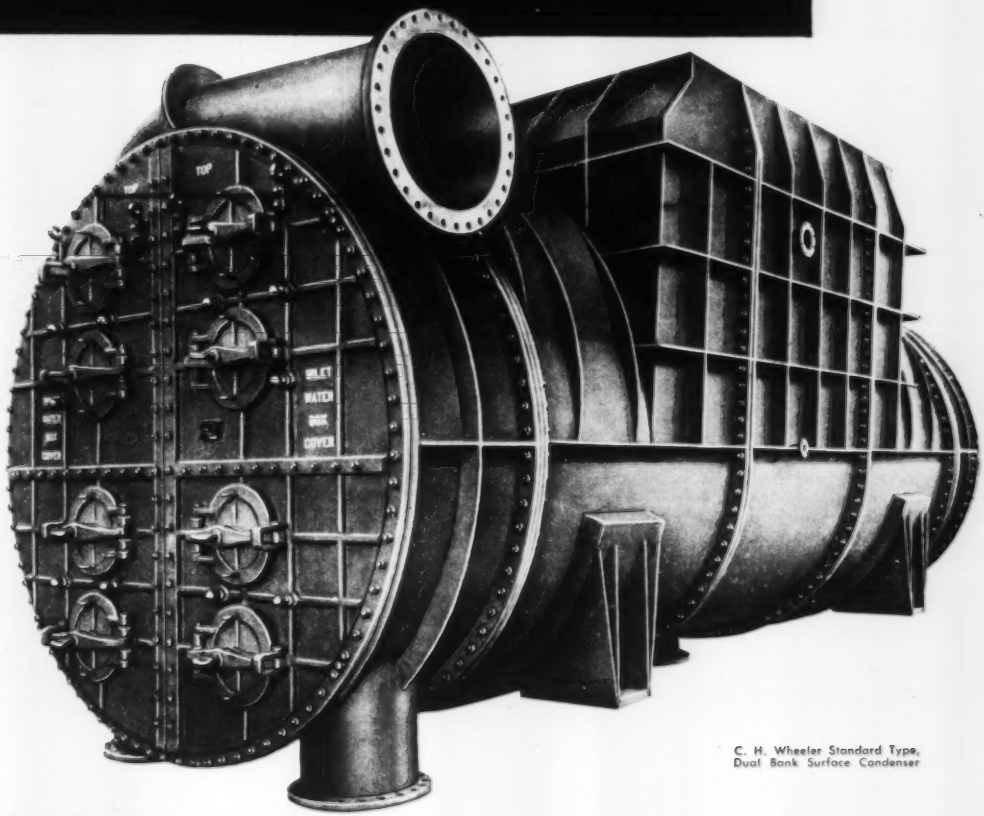

C. H. Wheeler Standard Type, Dual Bank Surface Condenser

WHEELER-ECONOMY PUMPS

. . . a new name combining old names that have been known and respected for generations. All the experience and metal working techniques this consolidation brings together are of great importance to you — our customer. Wheeler-Economy Pumps will fill your every requirement regardless of size or problem involved. Write to Philadelphia or to the nearest Economy or Wheeler representative listed in the phone directories of principal cities.

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WHEELER-ECONOMY PUMPS

ECONOMY PUMPS, INC. • DIVISION OF C. H. WHEELER MANUFACTURING CO.
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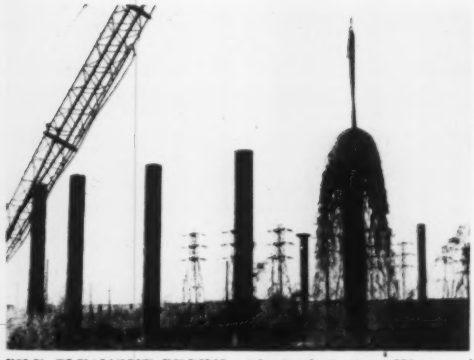
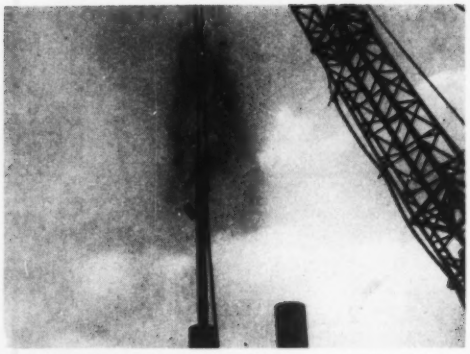
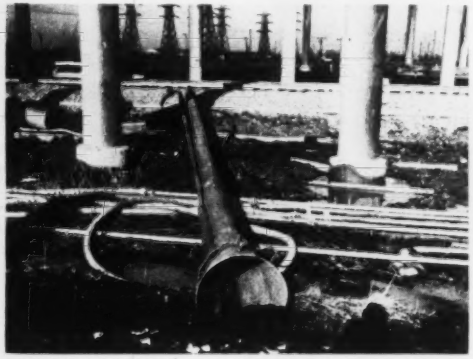


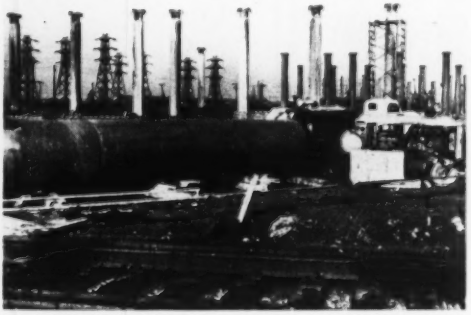
PILE CLEANOUT BEGINS with simple jetting. Water and air force out long plugs of clay.



CLEANOUT IS COMPLETED with a blow pipe that gets all the small pieces. Again, water and air do the work.



BLOW PIPE is 10 in. dia except for flare to 27 in. at bottom. Smaller pipe is jet. Muck rises through the larger one.



LARGE AIR CAPACITY for heavy blowing is provided by 600 cu ft receiver. Compressors are 315 cfm and 600 cfm.

Large-pipe piles make simple pier bents

Charles R. Waters
District Engineer
State Department of Public Works
Buffalo, New York

IDEAL CONDITIONS for large-pile foundations simplified the design of a major bridge for the New York Thruway—a 12-span viaduct over three railroad lines just east of Buffalo.

Each pier bent is a capped row of eight 30-in. steel pipes filled with concrete. Pipes were driven open-end to bed rock through 27 ft of clay. Bed rock is flat throughout the site, and the clay is hard near the rock.

The real story here is not in the simple design scheme and the ideal conditions. It lies in the pile size—30 in.—which is unusually large for a driven steel pipe. The story further lies in the way the contractor, Horton Pile Driving Co., Buffalo, took advantage of the conditions to put the design into effect.

Thirty inches is outsize when it comes to driving and cleaning out open-end pipe piles, so ordinary equipment had to be modified, new equipment devised.

• **Pile rig changed**—For driving, ordinary leads would not contain the pile, so the pile had to go alongside. This called for an offset hammer mounting. The hammer's anvil block also was changed to fit the large pipes.

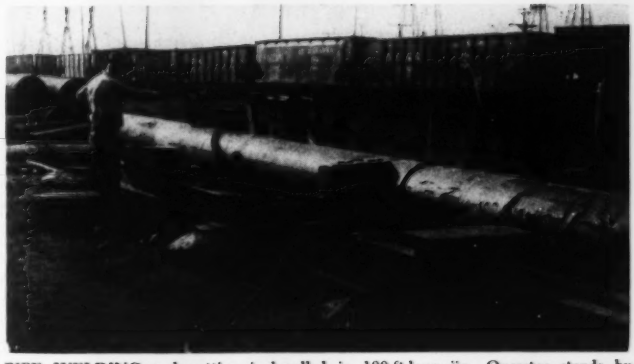
The driving rig was a crawler crane with an 80-ft boom and 90-ft hanging leads. A double-acting steam hammer delivering 15,100 ft-lb of energy per blow, rested in a special basket consisting of top and bottom brackets extending outward from a frame 10½ ft high. The frame's side members, 8-in. I beams, engaged the runners of the regular pile-driving leads, allowing the hammer to ride up and down in its offset position.

The hammer's anvil block was milled from solid steel. The main portion had a diameter of 32 in. and was 7 in. thick with vertical sides. An upward projection of 6 in. was milled to fit the hammer. A lower projection of 2 in. tapered down from twenty-eight in. to 27 in. dia. to fit loosely inside the pile-shell top. The 32-in. dia. main block provided a lip that gave full bearing to the top of the shell.

• **Easy driving**—In preparation for driving, each tube was set accurately in a wood box, or pen, previously installed in exact position. The box was slightly larger than the tube and was left in place throughout driving.

Shells varied from 50 to 54 ft in length. During driving, inspectors maintained a position check by means

SPECIAL RIG is required for outsize pile casings. Hammer is offset from leads.



PIPE WELDING and cutting is handled in 100-ft-long jig. Operator stands by automatic welder while pipe turner (foreground) rotates pile casing.

of two transit lines at right angles to each other.

Penetration was one inch per blow until the piles were about three-fourths driven. Then the clay hardened and penetration was a half-inch per blow. Driving stopped when the shell hit rock. This was indicated obviously by a rebounding action of the hammer.

Under favorable conditions 16 piles (2 bents) were driven in a day. The rate of pile clean-out was slower—about 4 a day.

• **Pile clean-out**—Because piles were driven open-end, it was necessary to remove a clay plug from the inside before pier reinforcement and concrete could be placed.

Air and water, both separately and in combination, did the cleaning. They were applied first with a simple jet pipe, then with a special blow pipe.

To provide large air volume, a 600-cu ft air receiving tank was served by two portable compressors, one 600 cfm and the other 315 cfm.

A throttle valve at the tank outlet made it possible to vary air pressure from zero up to the full 110 psi. Water pressure was 200 psi.

• **Clay plug rises**—First step in tube clean-out was to lower the jet pipe (60 ft long, 1⅛ in. ID) to the muck and apply water. The jet pipe then forced its way down to rock. In this preliminary operation the contractor was able by water pressure alone to raise and remove a clay cylinder 10 to 20 ft long. The average length was 11 ft. As soon as the tube was full of water, he switched to air, which ejected the water and loose material.

This preliminary blowing was completed for all eight tubes in a single bent before the next step was begun.

The next move was to place a 10-in. H-beam 30 ft long into the hole, raising it and lowering it successively until the remaining clay was loosened.

Then the blow pipe was brought into play. Mostly ten inches in diameter, it had a length of 57 ft. In the bottom 3 ft the pipe flared out to 27 in. dia. A jet pipe ran down the blow-pipe's outside, passing through the flare (see illustration).

This tool worked with alternate applications of water and air. Most of the remaining clay was blown in small pieces out the 10-in. pipe, with some going up through the pile tube itself.

The blow-pipe was moved up and down several times in the tube, the funnel scraping and cleaning the inside wall of the tube.

Inspection of the inside regularly showed it to be clean and in excellent condition to receive concrete. There was no difficulty with ground water.

• **Welding procedure**—In addition to driving and cleaning, there was another noteworthy feature of the work. Steel-pipe welding and cutting made good use of mechanical methods.

Pipe came to the job in 40-ft lengths. This meant short sections had to be welded on. Welding was done by a portable automatic flexible submerged arc welder.

The steel tubes were set up in a jig 100 ft long. The jig had pairs of rollers at intervals so the pipes could be rotated on these supports.

Tube sections varied somewhat from true circular shape, so the arm carrying electrode and flux feed was held by a roller attachment at constant position relative to the weld. The attachment was a roller-skate that supported the arm and rode on the pipe.

Variations from the true circle also made it necessary to rotate the pieces against each other until the best fit was found. For welding line-up and proper spacing of the beveled pipe ends, the joint was backed up by a circular band of ¼-in. steel plate 2 in. wide, which fit snugly on the inside. A ¼-in. raised bead on the center of the band's outer side served as a filler and separator of tube ends. This insert was spot-welded manually before automatic welding began.

During welding the pipe was rotated by a variable-speed pipe turner (see illustration). Two passes completed the weld. The following welding combinations gave best results:

	Speed in./min.	*Volts*	*Amps.*	*Electrode*
First pass	11	27	360	¼ in.
Second pass	8	27	500	¼ in.

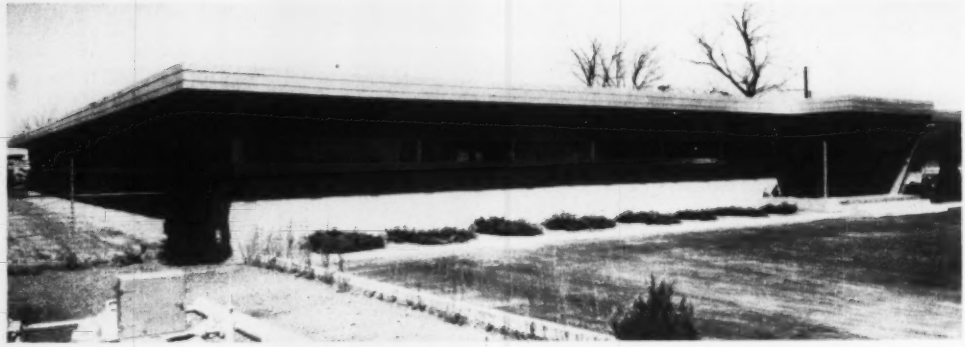
The welding tool operated on alternating current furnished through two transformers.

The same jig was used for cutting and beveling the pipe. A special arm, partly supported from a roller-skate on the pipe, held the acetylene torch.

• **Management**—This project is handled by District 5, New York State Department of Public Works. Design was under the direction of E. W. Wendell, Deputy Chief Engineer of the State Department of Public Works. Bertram D. Tallamy is State Superintendent of Public Works. Working out of District 5, Floyd E. Hurlburt is project engineer and Kyron C. Balkin is materials engineer. Horton Pile Driving Co. had the pier work as a subcontract with the prime contractor, Depew Paving Co., Depew, New York.

THRUWAY VIADUCT

Length	1030 ft.
Width	113 ft.
No. spans	12
No. piers	11
No. piles	88
Type spans	plate girders



EXTERIOR WALLS of a new office building in Tulsa, Okla., are built of colored concrete block that looks like brick.

Welded building erected without bolts

Bill E. Ferney
Chief Draftsman
National Tank Co.
Tulsa, Okla.

TIME WAS SAVED in erecting a one-story welded office building for National Tank Co. in Tulsa, Okla., by eliminating the need for temporary bolts in erecting the structural steel frame. Members were welded as soon as they were hoisted into place.

Built at a cost of $200,000, the structure is 100 x 150 ft in plan. Its structural frame is composed of wide-flange columns and junior beams, which support a steel-deck roof, 1½ in. of glass-fiber insulation and 20-year bonded composition roofing.

None of the structural steel members required shop fabrication. As a matter of fact, fabrication consisted only of laying out, burning and welding—operations that were easily executed on the site.

Lifted into place by a crane, beams were immediately tack welded to the columns, thus eliminating the need for laying out and punching holes for erection bolts. This method of construction, as well as the rigid-frame design, effected a considerable saving in erection time and weight of steel.

The steel roof deck is tack welded to the beams, thus adding to the rigidity of the structure. This construction eliminated the need for fastener clips and for cross bracing between the top flanges of the beams. The botton flanges are braced with steel angles, which also support a hung acoustical ceiling.

The building has a reinforced concrete floor finished with tan and gray rubber tile or green carpet in the offices. This floor is 2 ft above grade, making it necessary for the interior steel columns, which terminate just below floor level, to be supported on concrete piers. To eliminate formwork for the piers, the concrete was cast in light-gage steel pipe, which was left in place.

The 8-in. thick exterior walls are built of tan and rose-colored concrete block having the appearance of clay brick. Fascia and window trim are wood-grain embossed aluminum. Insulated with ½-in. glass-fiber insulation board, the walls are finished on the interior with steel panels up to a 7-ft high cornice and with mineral boards above the cornice.

Movable steel partitions are used to subdivide the interior. Offices are located along the exterior walls, and fireproof storage vaults, storage rooms and utility rooms are in the center of the building. The interior is lighted with single-pin instant-start fluorescent lamps.

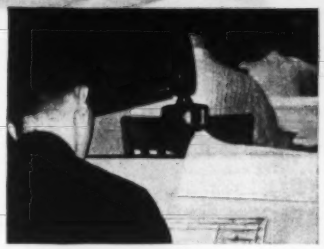
Since the building is air conditioned, windows have fixed sash and are double-glazed. Extending around the structure in a 2-ft high continuous strip, at eve level, they are just high enough for a standard filing cabinet to be placed underneath.

Temperature in each room is controlled by a thermostat in it. Separate ducts carry hot and cold air, which are mixed in the proper proportions to maintain the desired temperature before discharge into the room. Humidity, cleanliness and velocity of the air also are controlled. Automatic oil-bath filters, which periodically clean themselves by rotating the filter elements through an oil bath, cleanse the air prior to distribution.

To prevent cold drafts across the floor in winter, the designer called for air grilles in the floor against the outside walls. Cold air flowing down the walls enters a tunnel beneath the floor and returns to the air-conditioning unit. This tunnel also carries supply and cooling water pipes and fire lines.

The Engineering Department of National Tank Co. acted for the owner as architect, engineer and general contractor.

WELDED STRUCTURAL FRAME of the building, erected without temporary bolts, supports an insulated steel-deck roof. Exterior walls also are insulated and windows are double-glazed, because the structure is air conditioned.



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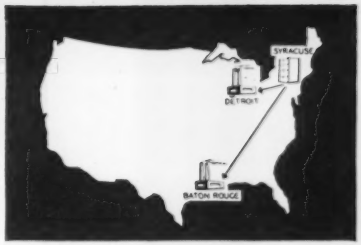

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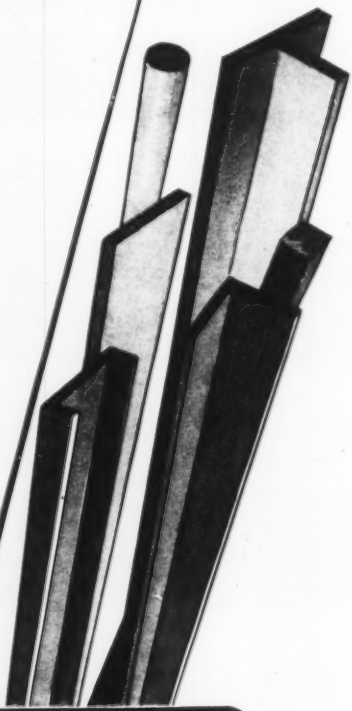

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CONNORS STEEL COMPANY
DIVISION OF H. K. PORTER COMPANY, INC.
BIRMINGHAM, ALABAMA

GOOD AS NEW—H. S. Knight demonstrates elasticity of reclaimed pipe gasket by stretching it with his left hand and foot. Another reclaimed gasket hangs loosely from his right hand. Although new gaskets were used when pipe was reinstalled, the reclaimed gaskets were all in condition for reuse.

Used concrete pipe goes back to work

THE last of 40,000 ft of concrete pressure pipe that had been dug up after seven years of service has recently been put back to use—said to be good as new.

First installation, in 1942, had been at a government explosives plant in Point Pleasant, W. Va., where the 36 and 24 in. dia pipe had been buried for water supply. The high pressure sections had steel cylinders encased and lined with reinforced concrete.

After World War II the Point Pleasant plant was surplus and the buried pipe was put on sale. Price Brothers of Dayton, Ohio, bought it —"as is," in the ground. They make pipe of this type, but the particular pipe had been made by Lock Joint Pipe Company in a portable plant operation at Point Pleasant.

Price Brothers counted on there being no damage to outer concrete surfaces of their buried purchase. And they banked on its flow characteristics and capacity being at least as good as at time of installation seven years before. Rubber and steel joints had been protected with mortar pointing, so they were expected to be in good shape.

• **Expectations justified**—H. S. Knight, vice-president of Price Brothers Co. was in charge of reclaiming the pipe. He had but two months in which to do the job. Four reclaiming units were organized, each consisting of a backhoe, a bulldozer and a compressor for operating air tools.

Pipelines had been laid through the flat land next to the Ohio River and up into the hills of West Virginia. Soil conditions included heavy clay, sandy clay, muck and quicksand. The four reclaiming units removed 40,000 ft of pipe, completely backfilled, regraded, replaced driveways and road in the two months.

They used the backhoes to excavate and expose the pipe. As each section was exposed, a cable sling was attached to it and the backhoe separated the joints and lifted the section out of the trench. Bulldozers backfilled and graded.

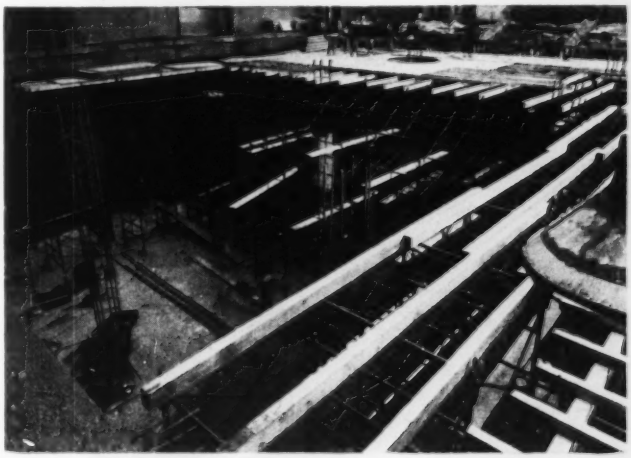
"The pipes were in perfect condition," reported Mr. Knight, "with absolutely no evidence of incrustation of any kind on the interior or exterior. Because the painted joints had been protected by mortar, the steel joint rings showed little sign of rust and the rubber gaskets looked like new and could have been reused.

"After we chiseled off the excess mortar at the joints with air tools and applied a new protective coat of a vinyl resin coating to the steel joint rings, the old pipe were in all respects like new. This, by the way, was the only cleaning or treatment required. Every piece of pipe was reclaimed except those buried in concrete encasements under highways and railroads."

Pipe was stored in yards near the old installation site and shipped to various jobs in Ohio, Kentucky, Pennsylvania and North Carolina.

• **New uses**—The City of Toledo has installed 16,600 ft of the 24- and 36-in. pipe. The Kosmosdale Cement Co. near Louisville used 1,000 feet of 36-in. for their main water supply line from the Ohio River. Three hundred feet of 36-in. is on an addition to a municipal water supply line for the city of Celina, Ohio. Charlotte, N. C., used 300 ft of 36-in. pipe for a sewer line under a railroad fill where pipe with high strength was required.

The balance of the 40,000 ft reclaimed has been installed by the American Waterworks Service Co. near Greensburg and Jeanette, Pennsylvania. All reinstalled pipe has performed to the complete satisfaction of the new purchasers.



STEEL SCAFFOLDING SUPPORTS FORMS—The concrete roof slab for underground parking areas within Pittsburgh's Gateway Center is 20 in. thick; shoring had to carry a 300-psf dead load. Labor and materials were saved by renting steel scaffolding. Adjustable bases on scaffold eased levelling and stripping. Slattery Contracting Co. New York, and Harrison Construction Co., Pittsburgh, jointly subcontracted to Starrett Brothers & Eken on the substructure work. (Universal Manufacturing Corp. Photos)

1 MAKE READY—Trench excavation by clamshell progressed simultaneously with construction of pipe-launching ways. Two hand winches used to move pipe into water are at the lake shore.

Intake launched on lake slowly sunk through 70 ft

J. C. Bates, Jr.
Bates & Dungey, Inc.
Sparta, Ill.

AN INTAKE STRUCTURE and subaqueous pipeline now tapping Lake Canandaigua for the Village of Newark, N. Y., was assembled completely on the surface of the lake, flooded and lowered into final position. While this method of installation was not without hazard, it proved to be sound and economical.

The village water supply project was engineered by the William S. Lozier Co., Rochester, N. Y. Bates & Dungey, Inc., of Sparta, Ill., placed the 2,200 ft of 24-in. pipe and a 30-ton intake structure on the bottom of the lake.

Subaqueous pipe was ¼ in. steel, lined, coated and wrapped, and joined with harness-type, flexible couplings. The 40-ft lengths used weighed about 3,000 lb. The intake structure was built up of similar pipe plus seven 24 x 36 in. flanged reducers, each topped with a perforated copper cylinder. The entire intake structure was fastened to a timber mat 35 x 50 ft in area, made of 8 x 8-in. timbers 5 ft c to c each way and floored with 3-in. oak planks laid diagonally.

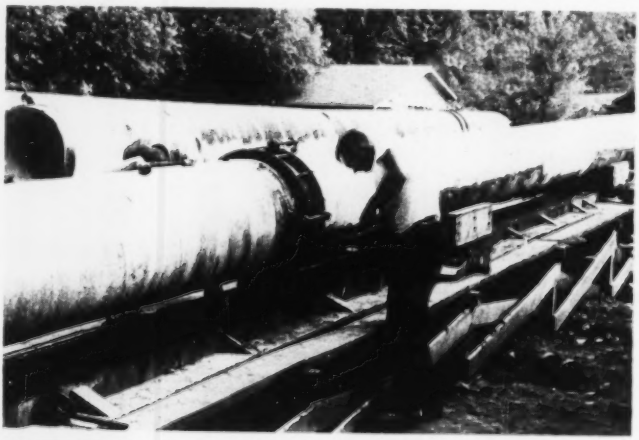
• **Launched from ways**—To assemble the pipe the contractor erected launching ways on the lake shore—two greased timber rails on which saddle skids carried the individual lengths of pipe into the water after assembly. A padded pipe rack for six sections of pipe was made an integral part of the ways and provided a temporary storage for pipe hauled to the lakeside as construction progressed on the narrow right-of-way.

Successive joints were bolted together, inspected, given a heavy coat of hot tar, and pushed into the water by hand winches mounted at the lower end of the ways. Out on the lake the pipeline was threaded through two staggered rows of pipe piling which had been driven into the muddy bottom.

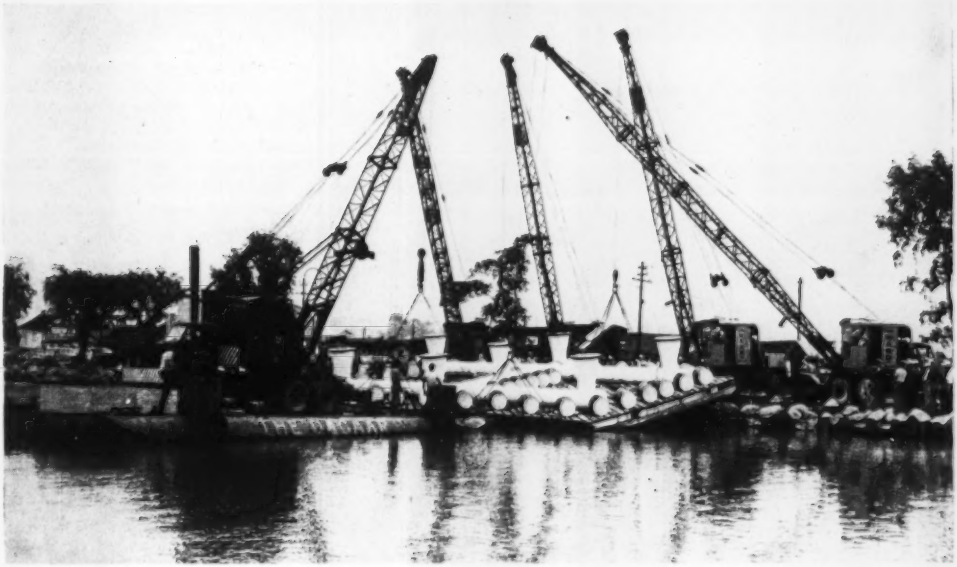
The line was buoyant of itself, its end being sealed and its joints tight. But added buoyancy was given it by some 400 air-tight oil drums that were to figure in the sinking.

• **Intake built separately**—While the pipeline was being assembled and floated, the intake structure was prepared for launching at the north end of the lake, 1¼ miles away. Five cranes joined to lower it into the water with care not to damage the municipal pier from which it was lifted. The intake structure, like the pipeline, was buoyed by oil drums filled with air. Forty-two drums were tied to the timber mat to add positive buoyancy.

When the 2,200 ft of pipe had been floated, the completed intake structure was towed to its end. A 20-ton truck crane operating from the deck of a 100-ton steel barge, picked the outer end of the pipe out of the water with one cable and hoisted the shore side of the intake structure above



2 PIPE ASSEMBLY was completed right on saddle skids topped with rubber belting. Tightened harness bolts provide tensile strength and a flexible joint.



3 INTAKE LAUNCHING—Five cranes were required to lift this 35 x 50-ft 30-ton structure into Lake Canandaigua. Diver later put perforated copper cylinders over the seven reducer intakes.

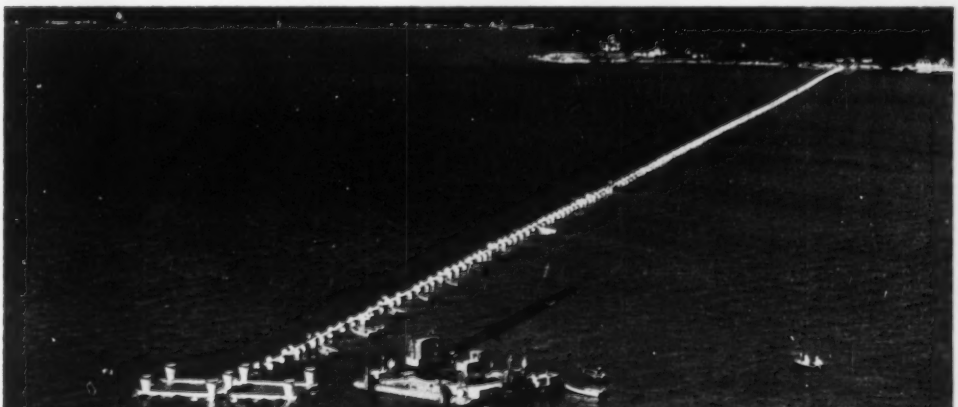
water level with the other. The watertight cap was removed from the end of the pipe; the pipe was joined to the intake structure; and the final coupling was in place. Line and structure were lowered back onto the surface of the lake.

• **Lower away**—With the barge moored into position at the outer end of the structure, a 4-in. plug installed for the purpose was removed and the entire assembly allowed to flood. The truck crane controlled the rate of descent of the intake structure as it sank to the bottom. Sinking of the pipeline was controlled by men in row boats stationed at alternate piles and operating small rope falls.

Since the oil drums supported the pipe within a few pounds, the small rope falls were adequate to control sinking. In this manner, the entire assembly was lowered without undue stress until it came to rest on the bottom in 70 ft of water. Jacob Benne, of Palmyra, N. Y., diver on the job from start to finish, released the many oil drums, which immediately popped to the surface and were salvaged.

Lastly, the intake was anchored with 100 precast concrete blocks, each 1 cu yd. Seventeen of these were placed on the timber mat supporting the structure itself. Remaining blocks were placed at the couplings and on either side of the deepest lengths of pipe.

The contractor pulled the temporary piling, disassembled the launching ways, and backfilled the shore end of the trench to complete the job.



4 SET TO SINK—Barge maneuvers into position to control sinking of intake. Men in rowboats with tackle on pipe piles will control sinking of pipeline, helped by buoyancy of oil drums.

SOIL DENSITY being determined in the field with the gamma-ray apparatus. The cage around the tube containing radioactive cobalt 60 is to remind the operator to keep at least a foot away from the end of the tube.

Researchers use rays to determine soil moisture and density in field

TWO SIMILAR SETS of apparatus are being tested by engineers of the Civil Aeronautics Administration as a means for determining soil density and soil moisture directly in the field. Such direct determination would eliminate the delays incident to laboratory determinations.

These studies are being made at the CAA Technical Development Center at Indianapolis and at Cornell University under a research contract.

Each apparatus uses a radioactive source and an electronic recorder. For each, a probe containing radioactive material is lowered into the soil being tested through a one-inch diameter stainless steel tube driven into the ground.

• **Soil density studies**—The soil density probe is 15-in. long and of a diameter that permits it to fit snugly into the steel tube. A capsule of radioactive cobalt 60 is inserted in the tip of the probe. Gamma rays from this cobalt bombard the soil surrounding the tube and are scattered by it. Some return to a Geiger counter mounted in the top of the probe. The number returning gives a measure of the soil density.

The counter is connected through a coaxial cable to an electronic recorder where the impulses resulting from the returning gamma rays produce neon-light flashes and movements of a swinging needle, which can be recorded.

Counts are made for a three-minute period, normally, to reduce purely statistical errors.

Graphs are being prepared at the CAA center for direct translation of the counter record into soil density in pounds per cubic foot.

Although the emissions of cobalt 60 are relatively weak, the probe is kept in a lead or concrete shield when not in use and operators are cautioned to keep at least one foot away from the active end of the probe.

• **Soil moisture determinations**—The soil moisture probe is only 7 in. long. Both polonium-beryllium and purified radium D are being used in the moisture determination. Both emit neutrons, but the useful life of polonium-beryllium is relatively short.

Neutrons are strongly affected by the hydrogen atoms in soil moisture. When they strike hydrogen atoms they are scattered and lose a large part of their energy, thus becoming "slow neutrons." After several such collisions some are reflected back to the vicinity of the probe, which also contains a piece of silver foil. When this foil is struck by a slow neutron it emits momentary flashes of beta rays which are recorded on the Geiger counter.

The number of these flashes gives a relatively accurate measure of the moisture content of the soil.

Power sufficient to operate this apparatus can be supplied by small, portable motor-generator sets.

Similar apparatus for determination of soil density has been under study at Rutgers University for some time (ENR April 12, 1951, p. 67). That apparatus uses two steel tubes driven into the ground, one for the radiation source and one for the radiation meter. In the Rutgers studies, the tubes were placed as far apart as 50 in.

Pollution picture in coal now not quite so black

Waste water treatment plants at all 173 anthracite collieries in Pennsylvania collect an estimated 6 million tons of coal as fine sizes and silt each year. A serious pollutant thus has been arrested, and a substantial return is being realized in reclaimed tonnages of marketable coal.

Desilting systems (Mar. 22, 1951, p 34) have now been operative at collieries for long enough to indicate they are completely successful when properly operated. Sizes of stilling ponds vary widely from plant to plant, depending on wastes produced and flow characteristics.

Reclamation of valuable coal from the collected silt is now a boon to the collieries, rather than to the dredging interests downstream. What was formerly waste is now a commodity steam-power plants will buy. And dredging of coal—on the Schuylkill, at least—is no more. Some 20 operators are still dredging on the Susquehanna and its tributaries, but they're working on remains of deposits built up over the past 100 years.

Anti-pollution efforts against coal-silt have had the bonus effect of relieving clogged stream beds and increasing channel capacities.

There is evidence, too, that water treatment costs have been reduced in cities along the Schuylkill that use it for public water supply. Nearly all cities on it use it, including Philadelphia. Fish are back in waters they had avoided for years, as further evidence of successful coal-pollution removal.

• **Next come acids**—Sister problem still prevalent in stream pollution from coal mining operations is the acid formed when air and water contact sulphur-bearing minerals in the diggings. The acid mine waste problem still awaits complete and universal solution.

Research continues at Mellon Institute, where neutralization of waters at the mine has been called impractical. The only hope so far is in preventing flow from mines to the streams. Regulations of Pennsylvania's Sanitary Water Board for permits to operate are aimed to keep water out of the pits by proper drainage.

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Indiana & Michigan Electric Company
Monongahela Power Company
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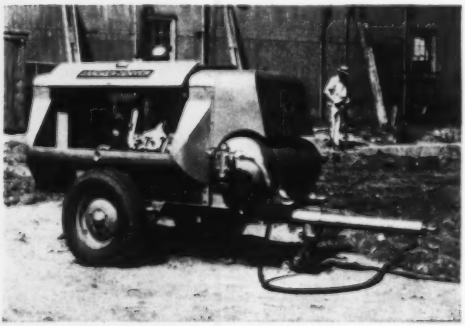

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THE QUALITY LEADER IN COMPRESSORS, PUMPS AND ROCK DRILLS

RUBBERIZED RUNWAY gets critical attention by engineers during week-long construction of test panels on new flight strip at Hunter Air Force Base, Savannah, Ga. (Andrew Bunn photo)

Rubber gets airfield trial

EYES of airfield engineers—and of the rubber industry—are on Savannah, Ga.

There at Hunter Air Force Base, the Army Engineers last month laid some runway test strips that may contain the solution to today's most vexing airfield construction problem—bituminous pavement failures due to fuel spillage and blast from jet airplanes.

Rubber—both natural and synthetic—was mixed with asphalt and tar hot-laid surfaces. The object is to discover whether a rubberized surfacing will succeed where straight bituminous mixes fail.

The test was one of opportunity. Dickerson-Winkelman, a joint venture contractor, was finishing a 10,500-ft runway on a brand-new location at this World War II airfield. Test work was negotiated under a change order.

Test construction involved only the top 1½ in. of a 3-in. hotmix pavement (over a limerock base and compacted sub-base). The test sections are 960 ft long at one end of the main runway (200 ft wide), and 180 ft long on a piece of the new taxiway. Aggregate gradation for test mixes is the same as for the regular pavement—a standard U. S. Corps of Engineers asphaltic concrete.

The difference lies in the mixes' bitumen content. There are six surfaces undergoing observation:

1. The regular contract mix, containing 6.0% of 85-100 penetration asphalt (control).

2. A mix of 6.2% asphalt, to which 6½ lb natural rubber has been added, per ton of mix.

3. A mix of 6.3% bitumen, of which 85% is the asphalt and 15% is a synthetic rubber, "Flintbinder A." (Flintkote Co.)

4. A mix of 7.4% bitumen, of which 85% is RT-11 tar and 15% is a synthetic rubber, "Flintbinder C." (Flintkote Co.)

5. A mix of 7.35% tar and synthetic rubber blend, "Surfa Aero Sealz," U. S. Rubber Co.

6. A mix of 6.9% RT-11 tar (a tar control section.)

All mixes are designed to meet criteria for 200 psi tire pressure.

Thus synthetic rubber receives the lion's share of attention, presumably because of its ability to resist the softening effects of petroleum products.

Here is how the test sections lie:

In the main 960-ft end-piece of the main runway, the first 60 ft (from the end) is made up of 10-ft panels the full runway width, beginning with Mix No. 1 and running through Mix No. 6.

Then there are five series of 30-ft transverse panels, each series containing the six mixes in order.

On a piece of taxiway there is another series of 30-ft transverse panels (here only 100 ft long).

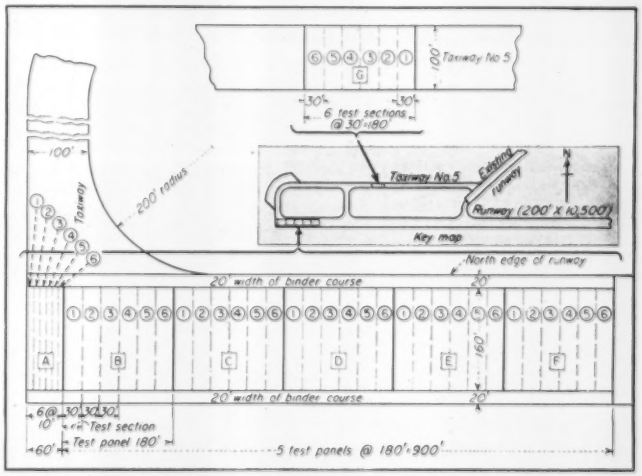
These tests and their observations are being made at the request of the U. S. Air Force.

For the most part, rubber was mixed with bitumen at the rubber companies' factories and shipped to the job by tank car. From then on the material was handled by regular contractor equipment. It was mixed with aggregates at the job asphalt plant and trucked to pavers at the site. Ordinary rolling procedure followed placement.

The order of construction was to place all strips of a given mix type in a continuous operation. Thus all of Mix No. 1 was laid before work began on Mix No. 2, and so on.

The appearance of the freshly-laid

(*Continued on p. 77*)



TEST LAYOUT—Panels are numbered to indicate the kind of surface treatment applied (see key in text). Runway 10,500 ft long, and taxiway No. 5 are all-new construction.

U. S. DEPARTMENT OF COMMERCE
Charles Sawyer, Secretary

BUREAU OF THE CENSUS
Roy V. Peel, Director

FACTS FOR INDUSTRY

FOR RELEASE: September 24, 1951

SERIES: M31L-00

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1950

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The latest U.S. Bureau of the Census statistics again provide proof of *top preference* for Wisconsin Heavy-Duty Air-Cooled Engines.

According to Census Bureau figures covering ALL carburetor type internal combustion engines (except automotive and aircraft) made by 41 different manufacturers, a total of 566,777 engines of 11 to 175 cu. inches displacement were produced and shipped by these concerns to other companies during 1950. (This does not include so-called "captive" engines built and incorporated into equipment of the same company).

Of the total of 566,777, Wisconsin Motor Corporation figures show that 206,737 were produced by this company, or 36.4% of the total in the specified H.P. range. The balance of 63.6% was divided among 40 other engine builders.

These figures are significant because they again offer outstanding *proof of preference* for Wisconsin Air-Cooled Engines by power equipment builders, distributors, dealers and users of power-operated machines and engines. And this preference is based on PERFORMANCE — best expressed by "Most H.P. Hours" of on-the-job service.

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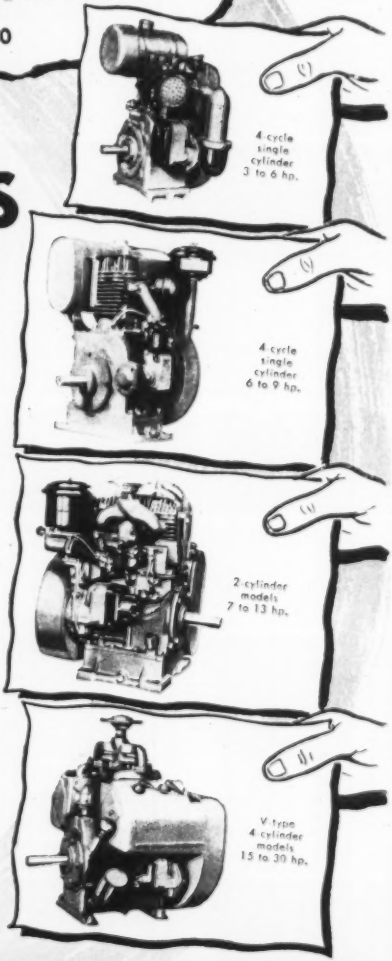
4 cycle single cylinder 3 to 6 hp.
4 cycle single cylinder 6 to 9 hp.
2 cylinder models 7 to 13 hp.
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RUBBERIZED PAVEMENT TEST SERIES

On March 10, the following test series was begun on the Hunter Air Force Base rubber-pavement test panels:

1. An F-80 jet plane.
   a. Standing 5½ min. with 40% throttle.
   b. Standing 1½ min. with 100% throttle.
2. JP-3 fuel spilled on an area, after which a jet plane makes locked-wheel turns on the area.

Test No. 1 is conducted twice daily for 10 days.

Test No. 2 is conducted once daily for 10 days.

Similar tests have been conducted on rubberized pavements at Friendship International Airport, Baltimore, Md., under sponsorship of the Air Research Development Board.

(*Continued from* p. 75)

pavement did not vary much from mix to mix, nor did the placement characteristics (how the mix came out of the paver) seem much different from those for ordinary asphaltic mixes.

However, the proof will lie in the watching. Van Allen Brady, of the Savannah District, U. S. Corps of Engineers, has begun a series of visual observations on the main runway test panels. These will take place daily at first, then at longer intervals. Results will be correlated with airplane operational data.

The taxiway test panels are available for controlled tests (deliberate drenching with jet fuel—not from aircraft—and observation of times for softening and recovery, for instance.)

On hand for construction of the test panels were men from the interested rubber companies—they actually took a hand in construction work. These men included Chris Seibel and Fabian Wiederecht of the Flintkote Co.; Samuel Tauber and Nate Smith, of U. S. Rubber Co.; and H. K. Fisher, William Ryan and Dale Fisher, of the Natural Rubber Research Bureau, Washington, D. C. Also Paul Phelan, of the Koppers Co., and William Mills of the Asphalt Institute were there.

Col. Robert Erlenkotter is district engineer, Savannah District, U. S. Corps of Engineers. From the district, Ben H. Cunningham directed the test panel construction. Working out of the South Atlantic Division's testing laboratory at Marietta, Ga., D. D. Tabb designed the test mixes and will cooperate in subsequent testing.

The contractor, Dickerson-Winkelman, is a joint venture of Dickerson, Inc., Monroe, N. C. and D. W. Winkelman Carolina Co., Greenboro, N. C. J. M. Nicholson is general superintendent and L. F. Mills is asphalt superintendent.

Notes on legal decisions

Summaries of decisions relating to construction work prepared by I. Vernon Werbin, counselor at law and engineer, New York, author of Legal Phases of Construction Contracts (McGraw-Hill Book Co.)

Stoppage due to picket lines

A building contract provided that the owner might take over and complete the work if the general contractor failed to supply enough workmen or materials to comply with the terms of the contract. Subcontractors were bound by the same terms. Nothing was said in the contract about employment of union labor.

The Keystone Engineering Corp. obtained a subcontract for electrical work on the job. It employed only union labor, but the general contractor employed both union and non-union men.

Following the appearance on the job of a union representative, who undertook to organize the general contractor's non-union men, pickets were posted around the job, whereupon the electrical subcontractor's men refused to cross the picket lines. As a result, the general contractor notified the subcontractor that if electrical work was not resumed by a certain date the subcontract would be canceled and that payment would be made according to the provisions of the general contract relating to cancellations.

When the men did not return, the general contractor employed another electrical subcontractor to do the work still remaining which cost more than the amount still owing the original subcontractor. The latter brought suit for $33,677 as damages for breach of contract. The general contractor then counterclaimed for $1,000, which was the excess cost of completing the electrical work.

During the course of the trial the general contractor withdrew his counterclaim and the court dismissed the subcontractor's claim and directed a verdict in favor of the general contractor. The subcontractor appealed, claiming the contract was breached when the general contractor originally employed another subcontractor to complete the work and that the notice given thereafter was given too late.

The judgment was affirmed on appeal,[1] the appellate court holding that the position taken by the subcontractor, "that it could not work so long as non-union labor was employed," was no jurisdiction for the failure to proceed with the work. Under these circumstances the general contractor was entirely justified in getting some one else to continue the unfinished electrical work which was holding up the entire construction work.

The court in its opinion further stated: "When a contractor on a building contract fails to perform, one of the remedies of the owner is to complete the contract, and charge the cost against the wrongdoer.[2] This is a right which was not limited by the general contract which, in its designation of the method by which the contract might be terminated, states that this is without prejudice to any other right or remedy." The court concluded that the general contractor in terminating the contract had followed the procedure outlined in the contract.

(1) Keystone Engineering Corp. v. Sutter, 78 A. 2d 191, Court of Appeals of Maryland, Jan. 10, 1951.
(2) Citing from Williston on Contracts, Rev. Ed. Vol. 5, sec. 1363, p. 3825, Restatement Contracts, ch. 12, sec. 346, subsec. (1), (a), (i), p. 573 and comment I, p. 576.

Reference in subcontract to the general contract

Where a subcontract for lathing and plastering work in a housing project included the general conditions of the prime contract by reference, the court held that such general conditions were made a part of the subcontract and that the subcontractor was bound to investigate its terms and conditions.[1]

(1) Trottier v M. H. Golden Const. Co., 233 P. 2d 675, District Court of Appeal of California, July 17, 1951.

Waiver of contract right

"Where a party to a contract has consistently acted in such a way as to indicate to his co-contractor that he does not intend to hold the latter to a particular provision of a contract, he is taken to have waived his right to enforce the provision."[1]

(1) Neustadter v United Exposition Service Co., 82 A. 2d 476, Superior Court of New Jersey, Chancery Division, July 10, 1951.

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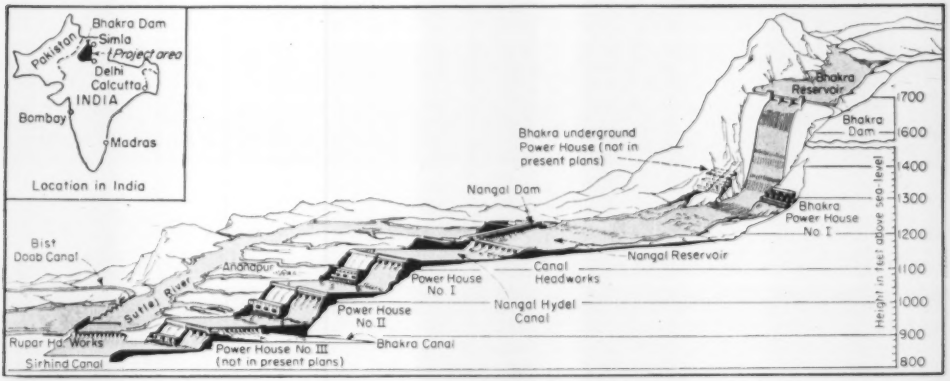


MAJOR ELEMENTS of India's biggest river development project, which contains a dam approaching Hoover in height and Shasta in volume; whose reservoir waters will feed a major system of power and irrigation canals.

India works away on its "Hoover Dam"

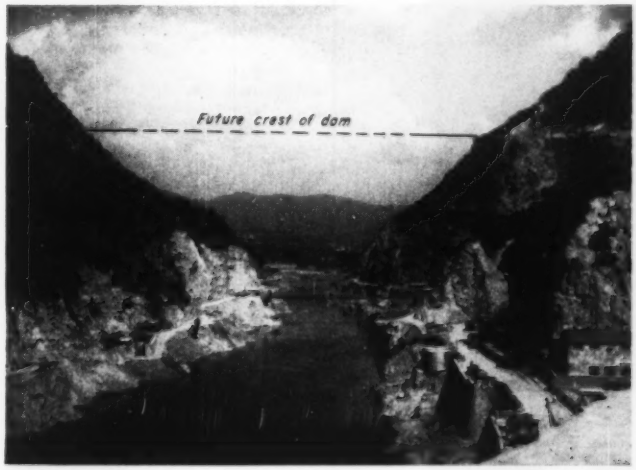
Waldo G. Bowman
Editor

ANNOUNCEMENT that the Indian government has appropriated $33 million for continuation in 1952 of work on its great Bhakra-Nangal river development project apparently signifies an intention to keep the job as close as possible to its 10-yr timetable. Since $50 million has been spent—both in preliminary work before the partition of India and Pakistan and during the three years since that interruption—about $30 million must be appropriated in each of the next seven years to complete the $260 million project to the extent now contemplated.

The 1952 appropriation may be said to keep faith with this program, although commensurate construction progress is more problematical. The Indian government is loathe to talk much about Bhakra-Nangal, beyond praising its features and future, because the field work is far behind promises—and even behind supposedly realistic construction schedules.

The principal difficulty seems to stem from a failure to come to grips with the requirements of the job. The great amounts of excavation to be moved and concrete to be mixed lifts the job far beyond any Indian precedent in mechanized construction. And even though this fact is clearly recognized and admitted there is a continuing hesitancy to replace the army of laborers with machines.

In this connection it may be significant to quote a recent news item from New Delhi which states that "progress on the Bhakra-Nangal project is retarded because nearly half of the required number of earthmoving shovels are unavailable because the U. S. is too busy with defense production to supply the needs of India." Whether this is a fact or not cannot be checked, but anyone who has seen the job would be certain to note that the shovels should have been ordered, and thus delivered, long before the U. S. defense program got under way. The Russians are already taking advantage of the situation by offering to sell India the machinery she cannot get "because the United States is rearming." And at the International Industries Fair, held during February in Bombay, the Soviets had large ex-



BHAKRA DAM SITE is a gorge in the front range of the Himalayas. The building at the right is the power and compressor plant used by the construction forces. (ENR photos except as noted)

MANY MEN AND A FEW MACHINES tackle job of driving two 60 ft dia tunnels each a half mile long. Shovel is excavating approach to one of the portals.

TUNNEL LINING GANTRY built in the job's structural plant has a 50 ft dia. It will be ready before the tunnels are.

habits of shovels, mining machinery, tractors and diesel engines as a backup to their propaganda.

But even though the project has its difficult aspects—constructionwise and political—its size and potential usefulness are so great as to command respect and interest.

Bhakra-Nangal is India's greatest single hydro and irrigation project (ENR March 1, 1951, p. 51). It is planned to service 3.6 million acres of farm land, and to produce power from 517,200 kw of turbines in its three initial power plants.

Situated in the northwest corner of the country in the Punjab area, Bhakra-Nangal takes its name from its two dams. Bhakra, the storage dam located in a gorge where the Sutlej River breaks out of the last foothills of the Himalaya Mountains, will be 680 ft high, 1,600 ft long and contain 5.12 million cu yd of concrete. It would thus be the third largest concrete dam in the world and nearly as big as second-place Shasta Dam. A straight gravity type dam with an overflow spillway, Bhakra is similar to, and about half the size of Grand Coulee Dam. It is, however, more often likened to Hoover Dam in somewhat the same way that the Damodar Valley scheme (ENR May 24, 1951) is referred to as India's TVA.

Bhakra's height, only 46 ft short of Hoover's and in excess of all other dams, is one reason for this comparison. Its two 50-ft (finished-diameter) diversion tunnels, the same size as the four at Boulder and in the same relative position—through either abutment—is another. And a third reason is perhaps the fact that John L. Savage, the designer of Hoover Dam, was also the chief consultant in the design of Bhakra.

Also, as applying to this comparison, is the fact that Hoover Dam was our first attempt at a truly big concrete structure—with 3.3 million cu yd it was six times the size of any then existing. For India, Bhakra occupies this same position, only in a more striking manner. There have been no concrete dams in the country heretofore, and the nearest approach to Bhakra's size is Mettur in the south of India a cyclopean masonry structure one-fifth as large.

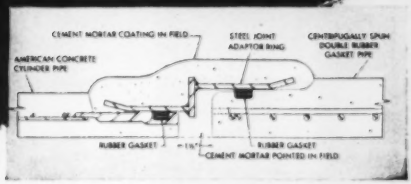
Nangal Dam, located 8 miles downstream from Bhakra, is a low (95 ft) structure, 1,029 ft long in the form of masonry-faced concrete piers and steel gates. Its purpose is to control and divert the daily discharge from Bhakra into a large (12,500 cfs) canal, known as the Nangal Hydel (for hydroelectric) Channel, on which two power plants are being built and a third is projected to utilize a total drop of 250 ft. This 38-mile channel will also feed the 100-mile, 12,500-cfs Bhakra Canal, main artery of the new irrigation system, as well as the existing Sirhind irrigation canal before rejoining the Sutlej near the town of Rupar. Main irrigation canals and branches, it is said, will total 538 miles, while the distribution canals and branches will add another 2,400 miles to the irrigation system.

• **Present operations**—Up to now, construction operations on the project have been entirely preparatory in so far as Bhakra Dam is concerned.

(*Continued on p. 84*)

A Money-Saving Combination!

Wherever Pressure Conditions Permit-- Different Classes of American Reinforced Concrete Pressure Pipe Can Be Combined in the Same Water Transmission Line


CEMENT MORTAR COATING IN FIELD
STEEL JOINT ADAPTOR RING
CENTRIFUGALLY SPUN DOUBLE RUBBER GASKET PIPE
AMERICAN CONCRETE CYLINDER PIPE
RUBBER GASKET
RUBBER GASKET
CEMENT MORTAR POINTED IN FIELD

Here's a typical example of the ability of American to meet specific project requirements... to give you a carefully laid out and engineered pipe line. You'll like the simplified planning and ease of installation this feature gives you.

By designing your pipe line to meet such specific project requirements you will achieve...

Greater Economy in Cost!

You know that reinforced concrete pressure pipe gives you the strength of steel and the permanence of concrete... with reductions in initial cost, lower installation costs, sustained capacity, and trouble-free service. Four classes of reinforced concrete pressure pipe are available to meet varying requirements.

So why not use the proper combination of these classes of pipe, where pressure ranges differ, to meet the needs not only of high pressure service but the needs of intermediate and low pressure service as well?

You'll find it the most economical way to plan a major capital investment...

...with Greater Savings in Critical Materials!

The conservative design principles of reinforced concrete pressure pipe are such that economical use may be made of steel and concrete to meet design requirements with appreciable savings in critical materials.

During the present defense emergency, these are valuable savings to make... and, they are savings that ease the problems of procurement, with less drain on the national economy.

So... if you find that the pressure ranges in your line are going to differ widely, give us the opportunity to show you how the combination of different classes of American reinforced concrete pressure pipe can save you money.

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A simple adaptor ring provides the transition between the spigot ends of two different classes of pipe.

In all classes of reinforced concrete pressure pipe manufactured by American, the rubber gasket is confined by a joint ring to a definite groove in the spigot end of the pipe, thus assuring the most positive and safest use of the gasket as a water seal under all normal operating conditions.

Recent Typical Installations Where This Feature Is Being Used to Obtain REDUCTIONS IN THE COST OF DELIVERED WATER

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City of Whittier, California

City of Pasadena, California

Pomona Valley Municipal Water District (now being installed) Pomona, California

Four Plants to Serve You

American manufactures four classes of reinforced concrete pressure pipe in diameters ranging from 12 in. to 12 ft., and for all pressures related to modern American waterworks practice.

Here's what WE mean by

HD-5
40.26 drawbar hp.
11,250 lb.

HD-9
72 drawbar hp.
18,800 lb.

*
HD-15
10› drawbar hp.
27,850 lb.

HD-20
Hydraulic Torque Converter Drive
175 net engine hp.
41,000 lb.

The Newest, Finest Tractor Line on Earth!

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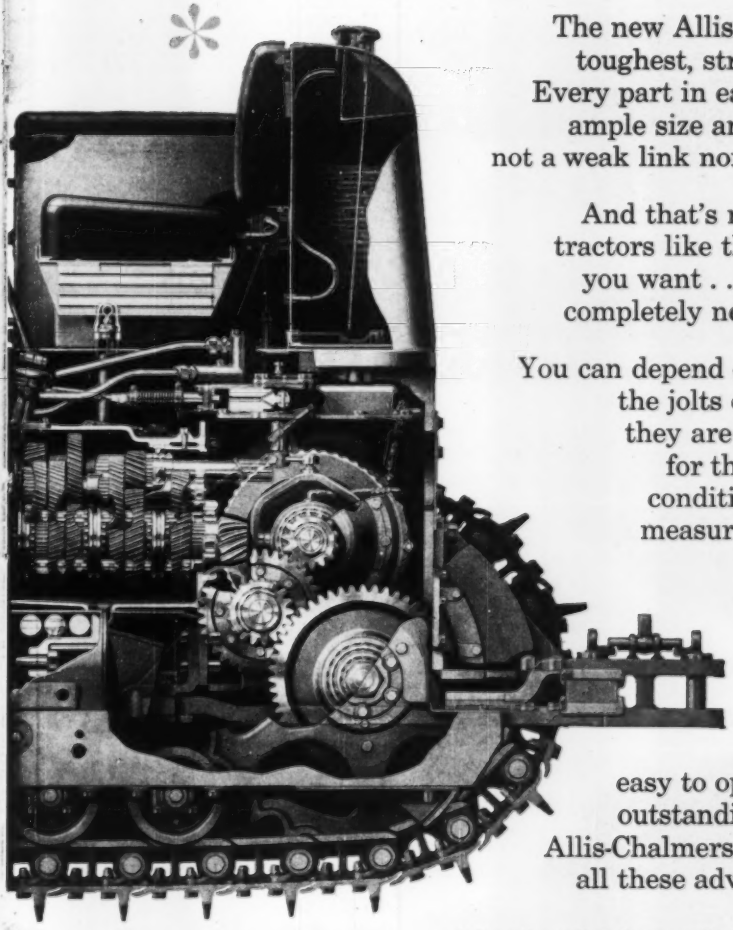
BUILT TO TAKE IT



The new Allis-Chalmers tractors are the toughest, strongest tractors ever built. Every part in each of the four models has ample size and strength to do its job — not a weak link nor a compromise anywhere.

And that's no accident! To bring you tractors like these . . . with the qualities you want . . . Allis-Chalmers built 'em completely new — from the ground up.

You can depend on them to take the loads, the jolts of today's jobs . . . because they are modern tractors designed for the most grueling operating conditions. They will more than measure up to your expectations!

Here are just a few of the many reasons why this NEWEST, FINEST TRACTOR LINE ON EARTH is *Built To Take It* . . . besides being easy to operate, easy to service and outstanding in performance. Your Allis-Chalmers dealer will gladly explain all these advantages . . . see him NOW.

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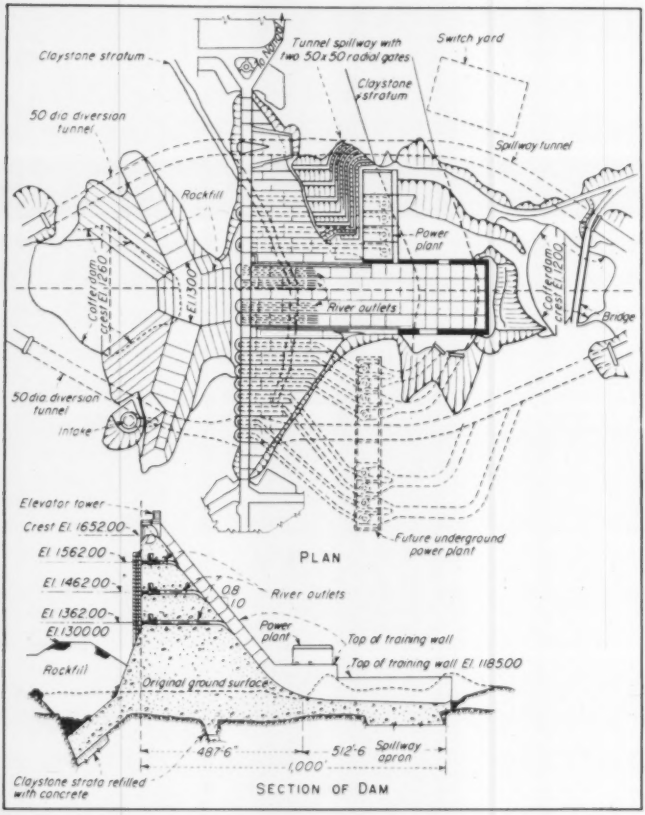
- More Power with Bigger Engines — Longer Engine Life
- More Weight, Greater Strength
- Long-Lasting, Large Diameter Clutches
- Extra Heavy Main Frames — No Extra Reinforcement Needed for Front-Mounted Equipment
- Double Reduction, Straddle-Mounted Final Drive Gears with Live Sprocket Shafts and Caged Bearings
- Positive Operating Track Release — Works in Oil on HD-9, HD-15, HD-20
- All New, Specially Designed Track Assembly
- Positive-Seal Truck Wheels, Support Rollers and Idlers — Mounted on Tapered Roller Bearings. 1,000-Hour Lubrication!

ALLIS-CHALMERS

TRACTOR DIVISION • MILWAUKEE 1, U. S. A.



BHAKRA DAM resembles Hoover Dam in several particulars but is of straight gravity type like Grand Coulee.

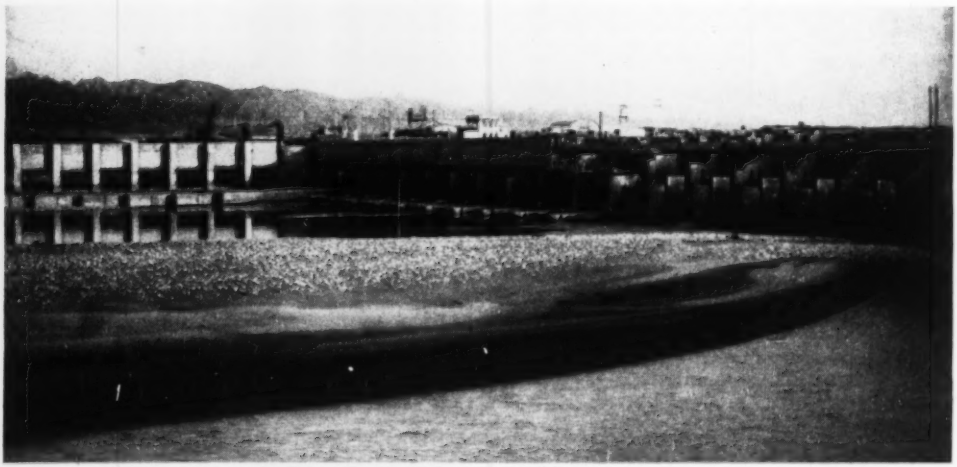
(*Continued from p. 70*)

These have included the building of access roads and a 40-mile rail line from the nearest railhead at Rupar, development of housing colonies for the workmen, driving the diversion tunnels (now about two-thirds complete) and some abutment sealing. Elsewhere on the project, Nangal Dam has been brought to virtual completion, and power canal excavation is under way as is work on the two canal powerhouses.

Compared to normal Indian dam building practice, the Bhakra-Nangal project is destined to require revolutionary steps in mechanization. So far, however, by American standards, the steps are being haltingly taken, although on the Nangal Dam work a crushing and screening plant was used, and concrete was mixed in a small central plant, hauled on an industrial railway and hoisted into the forms by a crawler crane. A few shovels and trucks have been used on the diversion tunnel excavation, but even on these huge bores, requiring 511,000 cu yd of excavation, a surprising amount of hand labor is still employed.

• **Bhakra Dam features**—The layout and section of the dam designed for the Bhakra site is shown in one of the accompanying illustrations. Only the left bank power house is included in present planning. Four 93,333-kva vertical-shaft generators driven by 115,000-hp Francis-type turbines are contemplated. The right bank powerhouse is foreseen as of underground

(*Continued on p. 87*)



NANGAL DAM and the adjoining headworks (left) to the power and irrigation canal are nearing completion. Note, in front of the headworks, the series of staggered conduits designed to exclude sediment and cobbles from the canal by picking them up and carrying them through Nangal Dam. (B. Krishna photo)

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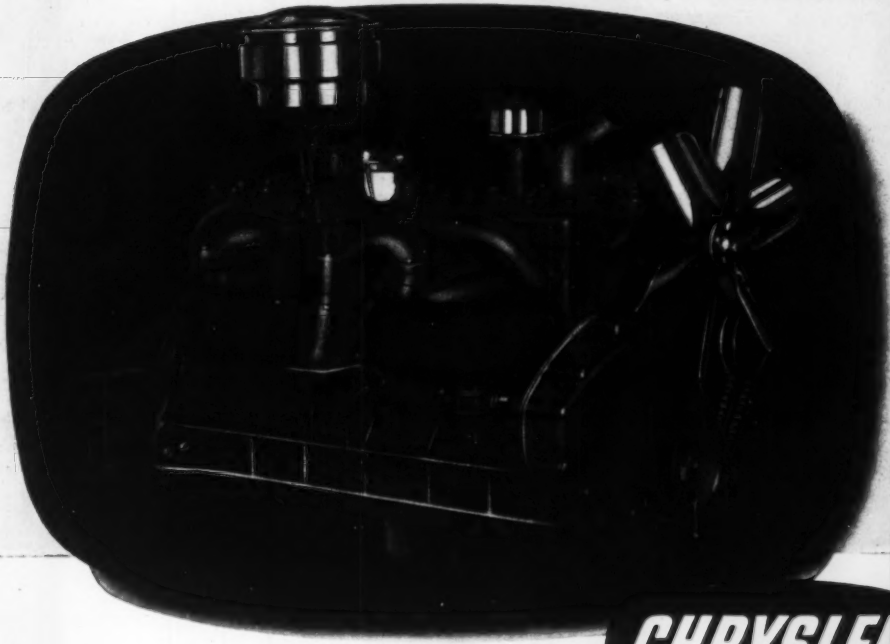

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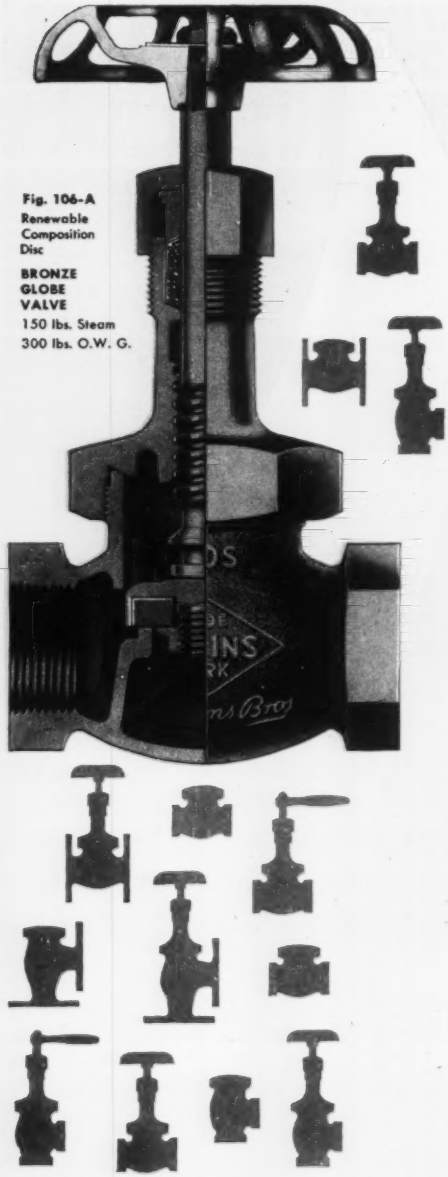
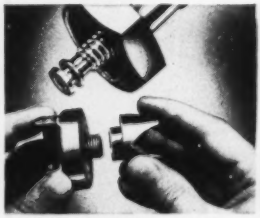


Fig. 106-A
Renewable Composition Disc

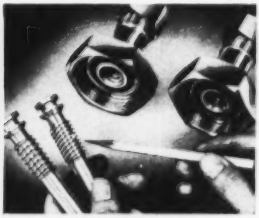
BRONZE GLOBE VALVE
150 lbs. Steam
300 lbs. O.W. G.

JENKINS FIG. 106-A "FAMILY"

Start with the standard Fig. 106-A. Trimming is interchangeable in Globe or Angle body, screwed or flanged.

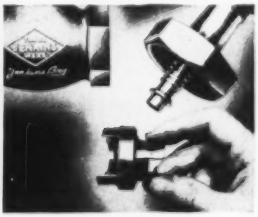


For Close Control — In throttling service, the nut which holds the disc in the disc holder is removed and replaced with Throttling Nut, Fig. 344.



For Quick Opening and Closing — Merely substitute the bonnet and spindle from Fig. 941, in which threads are pitched more sharply.

For Lift Check Service — Globe or Angle Bodies can be fitted with interchangeable Cap, Disc Holder, and Guide Disc Nut from Fig. 117A. Addition of spring from Fig. 655A provides spring loaded service.



For Stop & Check Service — Use the 106A trim, but substitute this spindle from Fig. 630A and replace the regular disc nut with the check valve guide disc nut.

Look over these pictures and see how easy it is to make up just the valve type you need, simply by interchanging parts. Think of the saving this means in maintenance expense . . . in reduced inventory of spare valves in your stockroom.

That's a big reason why the Fig. 106-A series takes top honors in any poll for valve preference. And Jenkins time-proved design, makes them the longest-lasting, lowest-upkeep valves that money can buy.

For example, see the heavy construction of the one-piece, screw-over bonnet. You can remove and replace it over and over again without distortion. See the extra size packing box,—and the perfectly machined threads on the heavy manganese bronze spindle, with more threads in contact with the bonnet, open or closed.

Remember, Jenkins Bros. is the originator of the renewable composition disc valve,—the *only* manufacturer of both valves *and* discs. For drop-tight, trouble-free performance, get acquainted with the Fig. 106-A "family". Despite their extra value, *you pay no more* for Jenkins Valves. Jenkins Bros., 100 Park Ave., New York 17, N. Y. Jenkins Bros., Ltd., Montreal. Sold through leading Industrial Distributors.

JENKINS
LOOK FOR THE DIAMOND MARK
VALVES
SINCE 1864
TRADE JENKINS MARK

(Continued from p. 84)
type equipped with eight units of the same size. Should it ever be built, it is projected as a tunneled-opening in the cliff, with such remarkable dimensions as a 500 ft length, an 80 ft width, and a 140 ft height.

In addition to the water that passes through the 15 ft dia power-house penstocks, other discharge from the reservoir will be handled by two spillways, one over the dam and the other in a tunnel in the left bank, which will incorporate the downstream portion of the diversion tunnel used during construction. The overflow spillway, 220 ft wide, will be fitted with two 100 x 28-ft drum gates and will have a discharge capacity of 163,000 cfs. The tunnel spillway, controlled by two 50 x 50 ft radial gates, will discharge 153,500 cfs. In addition there will be three tiers of 8 outlets each on the face of the spillway, with a combined capacity of 102,500 cfs. A total flood discharge of 419,000 cfs is therefore provided for, compared to a maximum flood recorded of 390,000 cfs. The reservoir will have a 7.4 million ac ft capacity, of which 5.7 million will be live storage.

The material on which the dam will be founded consists of beds of hard sandstone in which intrusions of claystone appear. The strata are inclined 70 to 80 deg from the horizontal, dipping from upstream to downstream, which is counted upon to reduce both hydraulic uplift and sliding.

Foundation preparation as now planned involves stripping the stream bed and abutments to depths of nearly 100 ft to remove weathered and shattered material. Total excavation is estimated at 3 million cu yd. Clay seams will then be removed, refilled with concrete, and the entire foundation area pressure-grouted.

That these rock conditions can present construction difficulties has already been shown in the diversion tunnel driving, where one rock slide practically closed the downstream end of the right bank tunnel after it had been excavated to its full 60 ft section. In order to get past this section, sides and roof had to be supported by cover-plated 12-in. H-section ribs on 2 ft centers. Similar but lighter ribs on 4 ft centers are used elsewhere, since practically the full length of the tunnels requires support.

The general plan of tunnel excavation being followed is to enlarge from an 8 x 10-ft pioneer bore holed through early as a part of the foundation exploration. Driving is from both ends of the half-mile long tunnels. Air drills are used, but much excavation is done by hand. Material is hauled out by trucks, generally loaded by hand.

CONSTRUCTING FOUNDATIONS for an arch structure that will carry canal over a large stream. The beam "forms" in the foreground are merely plaster over the natural earth that was left in place when the trenches were dug.

The Bhakra tunnels would present a difficult construction problem for an experienced, well-equipped contractor. They represent a herculean effort on the part of the day labor forces of the Indian government, and they are by no means finished. The latest estimate is March, 1953.

• **Nangal Dam and canal**—In contrast to slow progress on Bhakra Dam and the power features of the project, some of the irrigation facilities are relatively far along. As soon as the steel gates can be installed in the twenty-six 30-ft-wide bays of Nangal Dam it will be ready for use. The canal headworks, also a low dam with eight 24-ft-wide openings located adjacent and approximately at right angles to one end of Nangal Dam, are complete.

Canal excavation and the building of some 40 siphons and aqueducts to carry intersected streams across the canal are also under way. Since this latter work can follow Indian practice of using manual labor, it is progressing continuously if slowly. Canal excavation on the other hand must be carried out by machine before any appreciable progress can be made, for much of the alignment is through hilly country where large cuts and fills are required. Some of the embankments attain heights of 75 ft, and must be constructed on earthdam principles, while the normal section of the canal itself is 21 ft deep, 92 ft wide at the bottom and nearly 140 ft at the water surface.

Excavation work is also under way at the sites of the two canal power plants located 13 and 19 miles below the headworks. Each of these plants will be equipped with two 24,000 kw generators, which can operate on the water impounded daily in the 24,000 ac ft Nangal reservoir. In effect, they will be run-of-river plants until Bhakra Dam is complete. After that a third generator is planned for each plant.

• **A project to merit praise**—Even though the Bhakra-Nangal project is not advancing as fast as it might, it is one in which Indian engineers can take pride. To undertake a piece of work so far beyond their experience required courage of a high order. Their designs and hydraulic model studies have been thorough and well founded. Bhakra's spillway arrangements are ingenious and in keeping with the hydrologic history of the river. Extensive use of precast concrete blocks to face the Nangal Dam piers and thus eliminate formwork or masonry facing saved money and speeded the work. Fabricating on the job of the 50-ft dia frames for the tunnel lining jumbo was another operation of note.

The engineers and labor supervisors can also take satisfaction in the amount of old U. S. Army surplus construction equipment that they have been able to repair and keep running. If they had the new equipment necessary, it is possible that the Bhakra-Nangal project would be nearer than it is to fulfilling its destiny of reducing India's dangerous deficit in both food and electrical power production.

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Thompson-Starrett Co. to build big Turkish dam

The Thompson-Starrett Co., Inc., New York City, has announced that it will head the group that will construct an $11-million dam on the Sakarya River in northwest Turkey, which will be the first step of the $35-million Sarigar hydro-electric project financed by Economic Corporation Administration funds through the Eti Bank of the Turkish government.

Associated with the American company in the construction will be RAR Turk, Ltd., of Istanbul; Philip Holzman Aktions Gesellschaft, of Frankfurt; Hochtief, Aktions Gesellschaft, of Essen; and Siemens Bau-union (limited liability company) of Munich. Chas. T. Main of Boston is the principal designer on the project.

J. R. Van Raalte, president of Thompson-Starrett, said that the Sakarya Dam, impounding 7 million ac ft of water, when completed in 1954, will open much of the rugged northwest part of Turkey to industrial development in which American private capital has been invited to participate on favorable terms.

The dam will be 1000 ft long at the crest, 350 ft high and 275 ft thick at the base, requiring about 7 million cu yd of concrete. The Turks will provide about $10-million worth of steel and other basic materials, and Thompson-Starrett will ship in about a million dollars worth of construction machinery for the work about to start.

• **Other companies busy abroad**—U. S. construction firms working with local concerns are carrying out an extensive program of highway construction and reconstruction in Colombia, as follows:

Highway Buevaneutra – Cali – Cartago–Medellin; Raymond Concrete Pile Co. and Contratistas y Constructores, Ltd. will prepare and pave 68 mi of the highway soon.

Taraza–Planeta Rica–Cartagena–Barranquilla: Winston, Inc., and Montilla y Montilla are in charge and they report satisfactory progress.

Barbosa – Bucaramanga – Cucuta – Gamarra: Morrison Knudsen and Jaramillo Diaz are in charge, but only 30 percent of the equipment has arrived to date.

Ibague–Marillo, Manizales–Cartago and Manizales–Honda: Utah Construction Co. and Olarte Ospina–Ariaz y Pavan have to complete 44 mi this year, but so far only 40 percent of their equipment has arrived in Colombia.

The above plan, financed by the International Bank of Reconstruction and Development, will cover a total of 1824 mi of reconstruction and about 100 mi of new highways.

Mexico pushes projects for hydro development

Aided by a $29.7-million loan from the International Bank for Reconstruction and Development, Mexico is preparing to push hard on a program of construction that will include seven major hydro projects.

The loan is Mexico's third from the bank, to cover work programmed over a three-year period. To it will be added some $80 million of Mexico funds to be spent in 1952 alone on various hydro and irrigation works. When the projects are completed, they will add 700,000 kw to the nation's available electricity supply—nearly doubling existing generating capacity.

Projects scheduled, either from loan money or government funds, include: President Aleman Dam on the Papaloapan River in Vera Cruz State; Alvaro Obregon Dam on the Yaqui River, in Conora; a hydro dam on the Tingambato River near Mexico City. The Aleman Dam is said to be the largest such structure in Latin America.

Mexican engineers have warned, however, that the rapid growth of the nation's population and industry is such that these developments will provide only enough power for currently foreseen needs, and will certainly have to be supplemented shortly.

• **Port project**—Also as a part of the Mexican government's attempts to keep up with growing industrialization, the port of Marques on the Pacific coast in Guerrero State is to be converted into an industrial seaport, with a steel plant (operator not announced) and ship loading facilities.

• **Train machine operators**—In still another field, the drive to keep up with the demand for transport facilities is credited for the force behind a series of classes for construction machinery operators, conducted throughout Mexico by the Mexican Highway Association and the International Road Federation of Washington, D.C.

With more than 3,125 miles of highways under construction, highway officials had found that less than 5% of Mexican machine operators had proper training in use and maintenance of their machines, and there was no pool of skilled operators on which to draw.

Training courses were conducted by Frank S. Gilmore, of Kansas City, Mo., at various points throughout the country.

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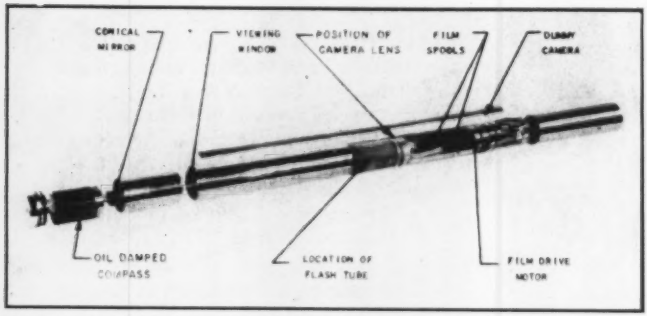

TO IMPROVE EXPLORATORY TECHNIQUES—This new U. S. Army Engineers bore-hole camera takes 360-degree photographs of a 3-in. diam bore-hole (either dry or wet). It is expected that eventually this development will improve exploratory techniques in the discovery of flaws in any type of bedrock in connection with dam building and other construction problems.

Bore-hole camera aids foundation work

It is announced by Lt. Gen. Lewis A. Pick, Chief of Engineers, that a new bore-hole camera to be used in solving foundation problems in the construction of concrete structures has been developed by the Engineering Research Associates, St. Paul, Minn., under the supervision of the Corps of Engineers.

Now undergoing extensive testing, the development is expected to improve exploratory methods by the discovery of flaws that commonly exist in all types of bedrock, and which may affect the stability of a dam or cause troublesome construction problems.

The camera can take 360-degree photographs of a 3-in diam. bore-hole. By a projector the picture can be viewed in undistored form on a cylindrical screen. A conical mirror in the camera produces an image of a 360-degree band of the bore-hole, which is photographed on a 16 mm motion picture film. As the camera descends, full coverage of the bore-hole is given.

A complete pictorial record of the bedrock features is then made to pass before the observer's eyes as if he were descending into the hole.

Asbestos-cement pipe improves underground

After several years of underground burial, asbestos-cement pipe shows no appreciable signs of deterioration, according to tests made by the National Bureau of Standards.

Not only that, but measurements of hydrostatic bursting pressures and crushing strengths show that the maximum strength of asbestos-cement pipe is not attained until several years of exposure underground.

These conclusions are contained in a report, "Effect of Exposure to Soils on the Properties of Asbestos-Cement Pipe," by Irving A. Denison and Melvin Romanoff, in the Journal of Research of the NBS, Nov., 1951. The paper summarizes results of tests on pipe buried in 15 different soils for a maximum period of 15 years.

There was no definite correlation between strength and length of exposure, according to the data obtained. Superficial softening occurred in some soils, but the depth of the softened layer was less than 0.15 in. Absorption of water was not confined to the softened layer but progressed beneath those layers.

However, bursting and crushing strengths of the pipes, after exposure, without exception were higher than the requirements of federal specifications for that class of material.

Consultation offered on prestressed concrete

Curzon Dobell, president of The Preload Company, which has built many prestressed concrete structures in the U.S. under its own patents and under license from foreign patent holders, announces a change in policy for the company. It will offer consulting services to any client who wishes to use prestressed concrete.

Mr. Dobell says Preload's own unrestricted systems of prestressing will be employed as a control with which proprietary systems must compete. This would enable clients to obtain competitive bids from general contractors, who may choose from among several prestressing systems.

Officers of The Preload Company include: chairman of the board, A. W. Brown, retired treasurer of John A. Roebling's Sons Co.; vice-presidents, M. L. Bass, president of the Byrne Organization, J. J. Closner, J. M. Crom and E. H. Thwaits; treasurer, K. E. Dixon; secretary, S. L. Sandoval.

Directors are Messrs. Bass, Brown, Crom, Dobell, J. H. Hession, president of the National Gunite Co., and F. W. Roebling III, vice-president and chief engineer of John A. Roebling's Sons Co.

Report shows fluoridation effective in Connecticut

A final report on research into fluoridation effect, printed in the Connecticut Health Bulletin for March, states that 1945-47 studies showed 28% less dental caries in children drinking fluoridated water than in a comparison group drinking water entirely free of fluorides.

Says the report: "Results . . . were so impressive that those in charge of the cooperating (comparison) group demanded fluoridated water for them." A new yardstick—expected dental caries based on past experience—had to be used to measure actual findings. Four years from starting, actual caries were 39% under the expected rate for 150 children, 6 to 16, drinking fluoridated water.

Steel report issued

Valuable information on the effect of nitrogen on the brittleness of certain carbon steels at low temperatures is provided by a recent investigation by the National Bureau of Standards. Results of fracturing V-notch specimens in Charpy impact tests indicate that increased nitrogen, if present as aluminum nitride, improves the low-temperature notch toughness at which brittleness appears in the steels studied. But nitrogen in the form of nitrides of iron or manganese apparently is detrimental from the same standpoint. The study was conducted by G. W. Geil, N. L. Carwile, and T. G. Digges.

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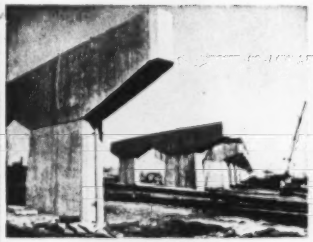

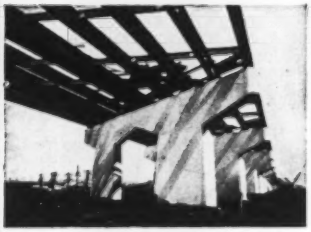

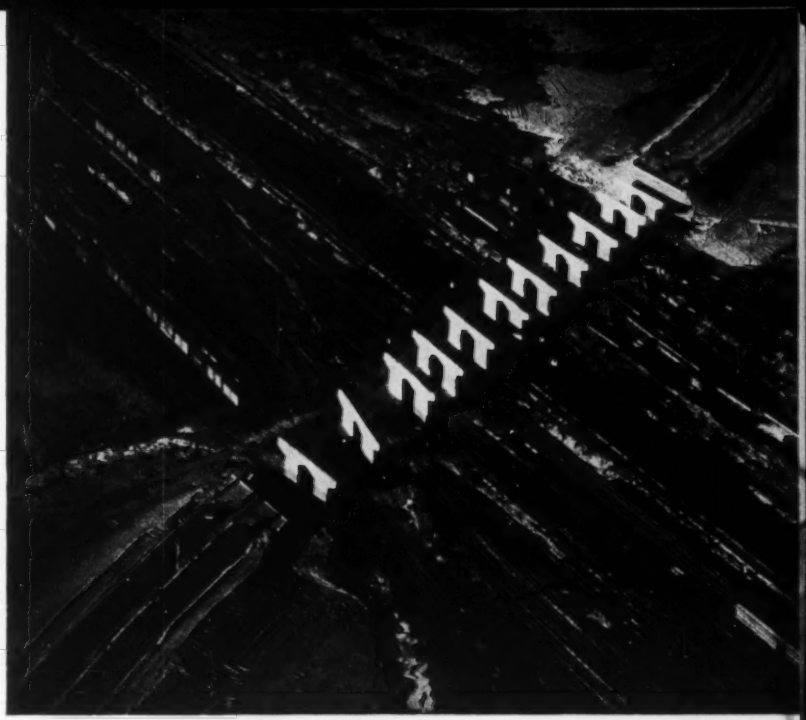

Raymond SALUTES THE NEW JERSEY TURNPIKE

RAYMOND IS PROUD to have played a vital part in the creation of this fabulous new cross-state highway. The railroad overpass near Ridgefield, N. J., is just one of several projects on the Turnpike that rest on Raymond Piles. 778 Raymond Pipe Step-Taper Piles driven for 11 piers and 2 abutments, with an average length of 120′ and a total footage of 93,283′ were used on this overpass—just another example of the part Raymond is playing in building tomorrow's world today.

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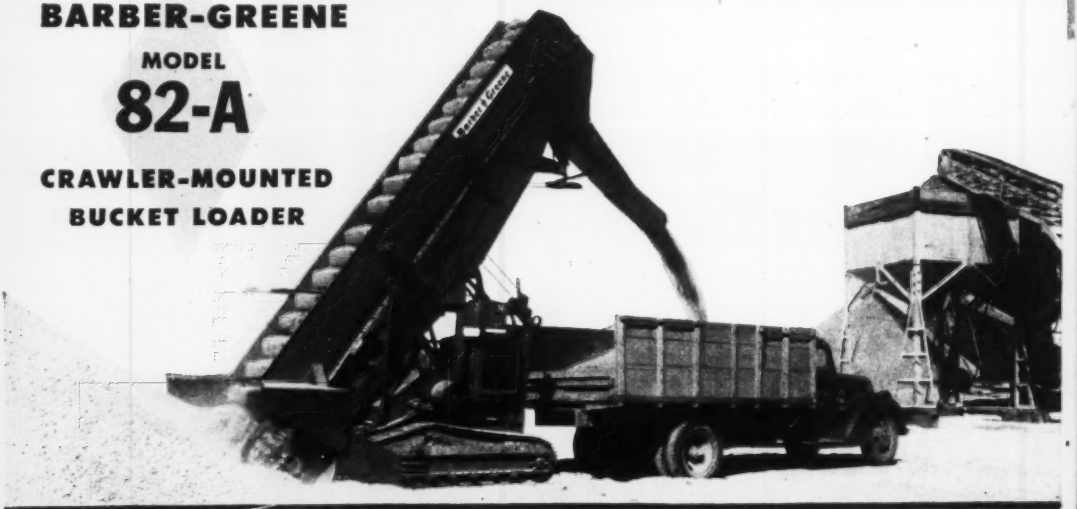
WHY NOT LOAD THE CHEAPEST WAY?

BARBER-GREENE

MODEL

82-A

CRAWLER-MOUNTED BUCKET LOADER



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your present loading cost . . .

wasted truck time . . . wasted man-hours . . . special operator . . .

the constant 3 cu. yd. per min. loading of the B-G 82-A . . .

the savings in man-hours and money possible on your loading jobs with a B-G 82-A Bucket Loader.

A B-G 82-A Bucket Loader is by all odds the cheapest and fastest method of loading free-flowing materials into trucks. Exhaustive cost analyses made throughout Barber-Greene's over 30 years' experience (during which B-G Loaders handled over a billion yards of material) have consistently proved this.

In addition, the B-G Constant Flow principle of loading eliminates cycle loading shocks . . . loader is easier to keep in adjustment, cheaper to maintain. Simple controls mean that each driver can load his own truck . . . no need for an expensive operator. Each truck can be loaded to full capacity without spillage . . . without truck damage or undue truck wear. Crawler-mounted, the 82-A provides positive traction in all kinds of going—on soft or muddy bases—on spots where pneumatic-tired rigs can't operate.

All this means that when you need a B-G 82-A Loader, you can't afford to be without one . . . ask for complete details.

see your B-G distributor

...ON JOBS LIKE THESE

STOCK PILE LOADING

Here's the most economical, and fastest, way to load bulk materials from stock pile to truck. No backing up, no swinging around, no lost motion whatever—the 82-A steadily eats into the pile, cleaning up as it goes—at less cost per yard than is possible with any other machine or method.

TOPSOIL STRIPPING

Stripping topsoil and loading directly to trucks is another fast, low-cost operation for the 82-A. Special notched topsoil spirals pulverize and "fluff-up" the soil . . . lumps are broken up to give every load the quality of rich, black loam. Close control of grade allows stripping *all* the topsoil down to the subsoil. This close grade control makes the 82-A especially suited to stripping jobs such as dump areas, park paths, highway dividing strips, etc.

BANK LOADING

Your truck fleet will be constantly on the move keeping up with the 3 cu. yd. per min. loading rate of the 82-A as it works the face of a tough gravel bank. It can be equipped with a double-deck vibrating screen to deliver sized aggregate to one truck and scalp oversize to another . . . making screening and loading a simple, simultaneous operation. Close grade control and cleanup scraper leave a clean, level floor.

AND MANY OTHER COST-CUTTING JOBS

WHATEVER the bulk material . . . sand, stone, gravel, coal, ashes, bulk chemicals . . . the B-G Loader will load into trucks faster, at lower cost. And a variety of screening attachments, boom extensions and spouts assures the easy adaptation of the 82-A to all your loading jobs.

WHEREVER your loading operations may be, the wide, long crawlers on the B-G 82-A provide the necessary traction for working on all soft, muddy bases. This means more workable days per season, every season.

WHENEVER you want to save as much as 60% of all truck time compared with intermittent dig and swing loading—

YOU NEED the Barber-Greene Crawler-Mounted Model 82-A Bucket Loader.

or write

BARBER-GREENE COMPANY
AURORA, ILLINOIS

GEORGE H. MIEHLS honored by architects in Detroit, Mich.

Engineer uniquely honored as friend of architects

A unique honor was paid to George Miehls, president of Albert Kahn, Associated Architects and Engineers, when he was made an honorary member of the Michigan Society of Architects.

Miehls graduated from Ohio State University with a degree of B.S. in Civil Engineering, and in 1919, after 17 months of overseas service with the 23rd Engineers, began his 32 years of continuous service with the Albert Kahn firm.

During his early years with the Kahn organization, as structural engineer, later as contact and project manager on much of the firm's work for the government, he demonstrated the administrative ability responsible for ensuing rapid promotions.

In 1943 he was elected vice-president, eighteen months later was made executive vice-president and in 1945, following the death of the last of the founding Kahn brothers, was chosen as president by his 25 key associates.

Part of the citation of award reads: "A true friend of his profession and ours, his vigilance and untiring efforts in ever striving for higher attainments, within and beyond his own organization, have been an important factor in the high regard which we now enjoy."

Another part of the citation read: "In 1949 he, an engineer, was called upon to join seven prominent architects in conference on 'Architectural Education'."

Grating industry leader forecasts doubling output

"The 'father' of the grating industry," was one of the titles given to Walter E. Irving by the Open Steel Flooring Institute when it honored him at a dinner at the Roosevelt Hotel in New York City.

In addressing members of the $50-million industry in which he and his company—the Irving Subway Grating Co., of New York City and Oakland, Cal.—have such a leading role, Irving foresaw a doubling of the output of the industry to draw off a part of the new steel capacity being built because of the war effort.

Some of the new uses he foresaw were:

Double decked streets to relieve traffic congestion;

Off street parking in open multi-floored structures;

Helioports on the roofs of existing structures where the weight of conventional floors would be excessive;

The armoring of warm-up aprons, taxiways and runways of airports accommodating jet planes;

The armoring of secondary roads;

Wider use of gratings in city streets for two purposes 1) to facilitate snow removal and 2) to cover utility trenches to make digging up of streets less frequent;

Rapid construction for temporary access roads;

Adding floor area to established buildings by the construction of mezzanine floors of grating.

Graduated from Rensselaer Polytechnic Institute as a civil engineer in 1896 he first worked as an estimator with a structural steel firm.

In 1902 he established himself, with $147 cash for capital, as an ornamental and structural contractor. Four years later, he developed the first open-mesh, non-skid sidewalk grating for the New York subday system. By 1916, his long Island City plant was devoted exclusively to grating manufacture mainly for industrial applications.

"I had to travel thousands of miles over many years to overcome industry's early prejudices against the use of grating as a superior flooring," he recalled. "Most of the rebuff's weren't based on sound engineering principles. In fact, they sound downright foolish today. For instance, they said people would lose money through the grating. It was hard sledding mainly because grating was new and against tradition. Certainly, open steel flooring was revolutionary as compared to the customary solid floor."

Irving developed and produced the first practical portable airfield landing mats before Pearl Harbor.

In 1942, he established special scholarships at RPI to be awarded on the basis of scholastic application and financial need.

Oldest engineering group elects new president

The Boston Society of Civil Engineers, oldest engineering society in the United States, recently held its 104th annual meeting. At this meeting Emil A. Gramstorff, head of Northeastern University's department of civil engineering, was elected president.

Prof. Gramstorff is a graduate of Massachusetts Institute of Technology and has been a member of the staff of Northeastern since 1921, and department head since 1939.

High cement group post goes to Carl D. Franks

By action of the Board of Directors of the Portland Cement Association last week, Carl D. Franks was appointed to the newly created position of executive vice-president. In his new post, Franks will exercise the duties of the president of the association during the absence of that official. To date, however, the position of PCA presi-

(Continued on page 96)

CARL D. FRANKS, executive vice president of Portland Cement Association.

just a TWIST of the wrist!

. . . That's about all it takes to restore new pump efficiency to Rex® Centrifugal Self-Priming Pumps even after many, many hours of rugged service. In every self-priming centrifugal pump, the air peeler is the most important single factor in priming efficiency. Rex is the only pump with an *adjustable* air peeler.

HERE'S HOW SIMPLE IT IS! Just remove cover plate . . . remove one bolt . . . drop peeler to just clear impeller . . . tighten the setscrew . . . replace the cover plate . . . and you've restored original priming efficiency.

There are only 6 basic parts to a Rex Pump (see illustration) . . . all readily accessible for quick, easy maintenance and replacement.

This simplicity means *longer pump life . . . sustained efficiency* and, above all, more *economical operation*—with Rex there's less chance for trouble . . . far lower maintenance costs . . . more gallons of water pumped per dollar of fuel and per dollar of cost.

See the new Rex line of Self-Priming Centrifugal Pumps at your nearest Rex Distributor, or write for Bulletin 51-37, which contains the complete story. Chain Belt Company, 4633 W. Greenfield Ave., Milwaukee 1, Wis.

CHAIN BELT REX COMPANY ®

CONSTRUCTION MACHINERY . . .

What's the capacity of this block?

If you don't know.. *don't use it!*

If it's a 5-ton pull on a 3-ton wire rope block . . . *somebody may get hurt.* But if it's an American CROSBY wire rope block, it's LOAD-RATED . . . and your men will find its safe working capacity *embossed in the side plate.* Isn't that simple safety insurance? American CROSBY blocks are built with tremendous, rugged strength . . . the same kind of quality found in big American crane blocks. Individually packaged, too, for delivery in perfect condition. Sold by distributors and supply houses everywhere; made by the makers of genuine Crosby Clips, famous wire rope fasteners... AMERICAN HOIST & DERRICK CO., ST. PAUL 1, MINNESOTA.

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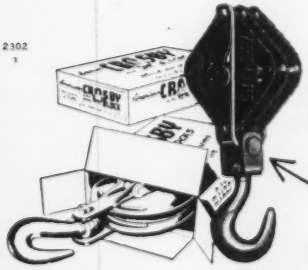

American CROSBY Load-Rated! WIRE ROPE BLOCKS

Men and Jobs . . .

den—left vacant by the death of Frank T. Sheets last November—has not been filled.

Franks is a career man with PCA; having been with the association since its establishment in 1916. A graduate of Purdue University with a B.S. of C.E. degree, Franks served 8 years as district engineer in charge of the Indianapolis office. In 1924 he was advanced to regional manager and, during the past four years has been vice-president for promotion.

Careers . . .

• **Appointed**—**Wiley & Wilson,** consulting engineers with offices in Lynchburg and Richmond, Va., has started the celebration of its 50th anniversary with the appointment of five associates to the firm: **George Hunt,** industrial engineer, is assigned to the Richmond office. The others are **Robert B. McNutt,** civil engineer; **Ernest Frewen Wilson Jr.,** mechanical engineer; **Gilbert M. Peery,** electrical engineer; and **Thomas Richards Leachman,** architect, all attached to the Lynchburg office. All five men have been with the firm, which specializes in public works, sanitary engineering, industrial plants and utilities, for a number of years . . . A prominent Boston engineer, **Frank K. Perkins,** has been selected by the Special Commission on the Structure of State Government to investigate the Department of Public Works of Massachusetts. He is presently employed by Thomas Worcester Inc., a firm which has done a large volume of work with DPW. . . **Clifford L. Mutch,** Bureau of Reclamation construction engineer, left Washington for New Delhi, India, to serve with a six-man mission concerned with major river development programs.

• **Elected**—Election of **Henry B. Bryans** as vice president and member of the board of directors of the United Engineers and Constructors, Inc., has been announced by **Col. Edwin M. Chance,** president.

• **Honored**—Dr. Maria Telkes, research associate in metallurgy at the Massachusetts Institute of Technology, received the first award for meritorious contribution to engineering given by the Society of Women Engineers. The award was for her wartime work in designing a distilling system that uses solar heat to convert sea water to drinking water . . . Travis chapter, Texas Society of Professional Engineers, named **John D. Miller,** pioneer Texas photogrammetrist, as its choice for "Outstanding Engineer of the Year."

OBITUARIES

Frederick T. DeLany, 73, president of the W. J. Burns Co., Syracuse, N. Y., and for many years a leading building contractor in the area, died March 12. His firm erected many structures in the Syracuse district. He was a 1902 graduate of Syracuse University.

Samuel Zion, 64, a civil engineer who was founder and president of the Dominion Lock Co., Ltd., Montreal, Que., died March 10. He trained as a civil engineer at Tufts College and was first employed by the General Electric Co. He was retained by the United States Army during construction of the Panama Canal and served with the Boston Navy Yard during World War I.

G. A. Beckwith, 83, retired civil engineer, who as an engineer with the Port of New York Authority, worked on the construction of the Lincoln and Holland tunnels, died at Paterson, N. J., March 15. He was an 1890 graduate of Columbia University. He had done work for the Passaic Valley Sewage Commission and the N. J. Highway Commission.

Alfred H. Paradis, 69, Canadian engineer, died March 6 at Miami, Fla. His home was in Montreal. After training in engineering and commerce, he joined the Transcontinental Railway as engineer on location. He later formed the firm of Paradis and Sons, which he headed until his retirement in 1948. He served on the board of directors of numerous Canadian concerns.

George Bragg Massey, 76, of Winnetka, Ill., retired civil engineer, died March 9. He was graduated in 1895 from Yale University.

James B. Marshall, 60, civil engineer and former city manager of Charlotte, N. C., died March 10. About 30 years ago he went with Tucker and Laxton, engineering and contracting firm. He later was in charge of public works at Charlotte and was made city manager in 1935, serving until 1940, when he resigned and joined the Goode Construction Co. at Charlotte. Later he formed another company which specialized in the construction of airfields in Virginia, North Carolina, South Carolina and Georgia, and after World War II became associated with J. N. Pease and Co., Charlotte engineering firm.

(*Continued on next page*)

On the job . . . and on the bond
EXPERIENCE COUNTS

It's the key to performance in any field. Year after year, the contractors of America — with building experience unmatched anywhere—prove this fact in achievements which dwarf the seven wonders of the world.

The Ætna Casualty and Surety Company is proud of its long association with many leading firms in the great construction industry. Working hand in hand with them on projects of every size and type, it has gained a wealth of experience and knowledge that is your assurance of prompt, intelligent contract bonding service on any job, anywhere, anytime.

"No Job too Big— No Job too Small"

ÆTNA

ÆTNA CASUALTY AND SURETY COMPANY

The Ætna Life Affiliated Companies write practically every form of insurance and bonding protection

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Ætna Life Insurance Company
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Automobile Insurance Company
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With the WELD that Never Fails!

Kerrigan grating is a one-piece INSEPARABLE unit. Bearing bars and cross-bars are WELDFORGED by Kerrigan's exclusive process into ONE PIECE. Resulting grating is a strong, anti-slip, easy-to-clean grating that affords maximum light and ventilation, a minimum of installation and maintenance expense, and long years of trouble-free use.

BONDERIZED for rust resistance and extra protection against corrosion! Holds paint to metal for durable finishes.

WRITE FOR CATALOG AND SPECIFICATION SHEETS;

and for a copy of "A PICTURE STORY OF KERRIGAN" which shows how KERRIGAN *Weldforged* steel grating is custom engineered . . . and how Kerrigan's Never-Fail Weld stands up under the severest kind of punishment. Just write on your letterhead for free copy.

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GENERAL SALES OFFICE, 274 MADISON AVE., N.Y.C.
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Obituaries . . .

Otto Fuetterer, 65, former Oakland, Calif., harbor engineer, died in Alameda, Calif., Feb. 27. He was a native of Germany and a graduate of Freiburg University.

David H. Baldwin, 78, a civil engineer and expert topographer with the United States Geological Survey in Washington, D. C., died there March 9. Upon retirement 6 years ago, he was assistant chief in the computing section of the Survey, Department of the Interior. His Baldwin solar chart has been standard equipment for topographic surveys for many years. In 1898 he was graduated from Columbia University in civil engineering and the same year worked on the proposed Nicaragua Canal as a hydrographic and topographic engineer.

Nicholas Kous, 55, a civil engineer of Syracuse, N. Y., died March 8. He was engineer in charge of building the Bethlehem shipyards in Baltimore during World War II. He also had served as a school construction engineer in New York City.

John O. Miller, 65, a civil engineer with the California Division of Water Resources since 1938, died in Sacramento, Calif., March 7. He received an engineering degree from Stanford University in 1908. At the time of his death he was supervising hydraulic engineer for the division of water resources.

Lloyd O. Whitcomb, 79, retired civil engineer, employed by Toledo, Ohio for 35 years, died March 6.

George B. Hoke, 69, Akron, Ohio, retired bridge engineer, died March 6. He had been an engineer with the American Bridge Co. in Gary, Ind., retiring in 1947. He was graduated from Pennsylvania State College, and was an engineer in the building of the Oakland Bay Bridge in California and Stevens Hotel in Chicago.

J. Tom Lanthorn, 67, retired civil engineer, died March 3 in Indianapolis, Ind. He retired three years ago after having been employed 39 years by the U. S. Army Engineer Corps in the Huntington, W. Va., district.

Harry R. Hayes, former commissioner of public works and city engineer of Utica, N. Y., died March 7 in Albany, N. Y. After acting as city engineer he was engineer director of the N. Y. State Highway Contractors Association. Afterward he was made engineering director of the N. Y. State Crushed Stone Association at Albany. He was

organizer and first president of the State Association of City Engineers. He was a graduate of Rensselaer Polytechnic Institute.

John P. Kelly, 75, a civil engineer, died March 5 in Buffalo, N.Y. He received his civil engineering degree from Lehigh University and from 1907 to 1909 was western divisional engineer for the State of New York. Later he worked in the engineering departments of the Bethlehem Steel Co. and Republic Steel Corp.

George Baker Long, 78, financier and builder, of Brookline, Mass., died Feb. 29 in Boston. He built many large projects, among them the Sheraton Hotel in Worcester, an addition to the Boston Public Library, the Prudential Building in Buffalo, N.Y., much of the Kentucky Capitol Building, and large installations for the All America Cable Co., in Peru and Ecuador.

George A. Freeburg, 67, retired structural engineer, died Feb. 21 in Elgin, Ill. His home was in McQueen Station, Ill. He had practiced in Chicago for 30 years.

J. Robert Proctor, 53, a county engineer for 18 years, died Feb. 22 in Pittsburgh, Pa. He worked at the Greater Pittsburgh Airport for the last five years.

William Moeller, 75, retired general superintendent of Lone Star Cement Co.'s western division, died at Dallas, Tex., Feb. 24.

Bernard L. Green, 82, an honor graduate of the University of Michigan, and former president of the Osborn Engineering Co., died at Cleveland, Ohio, Feb. 28. During his presidency, Osborn designed many public structures including the Yankee Stadium, New York; the Cleveland Municipal Stadium and the Notre Dame University Stadium.

James R. Law, 67, chairman of the Wisconsin Highway Commission since 1943 and former mayor of Madison, Wis., died March 14. As highway chief, Law led the successful 1945 drive to segregate highway funds from the state general fund so they would be used exclusively for highway purposes. He was mayor of Madison from 1932 to 1943. Law was originally an architect, training at the University of Pennsylvania from 1907 to 1909 before returning to Madison. His work included the design of 40 to 50 schools in Wisconsin and of numerous other buildings in Wisconsin and Illinois.

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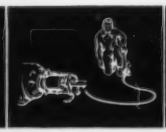
DOES EVERYTHING

but walk and talk!

It's a "Porto-Power" . . . not an *ordinary* jack! And "Porto-Power" wipes out scores of traditional construction and maintenance methods which, by comparison, are downright money-wasting! Every-day savings are dramatic — so you'll want to get the *full facts* and order "Porto-Power" *immediately!* See leading supply houses or write Blackhawk today.

TOE-LIFT—Raise from a 1½" low. Replace crowbar methods.

PUSH OVER ANY SPAN — Eliminate dangerous blocking up.



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STRAIGHTEN parts. Apply force exactly where you want it!

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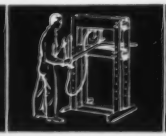
BEND RAIL. Straighten shafts. Insert or remove bushings, pins, etc.



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CLAMP parts for welding or bolting—short or long spans.

Every contractor needs this S-79 KIT

This is the basic "Porto-Power" assortment for *every* contractor. Its 20-ton remotely-controlled hydraulic jack and 12 attachments pay for themselves on one or a few routine assignments. (You can get "Porto-Power" in 2, 4, 7, 10 and 50-ton sizes, too.)

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Bids Asked—Low Bidders—Contracts Awarded—First Section

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ELSIE EAVES, Manager *J. A. MAHONEY, Reports* *M. R. ROESSLER, Statistics*

NEW ENGLAND

BIDS ASKED—HEAVY CONSTRUCTION

▲ **MASSACHUSETTS**—B.A. 4/15—Commonwealth of Mass., Dpt. P. Wks., 100 Nashua St., Boston.

Boston—Superstructure for elevated hy., Haymarket St. to North St. Sect., J. F. Fitzgerald Expressway, $2,175,000. Plans deposit $50 refundable. CD 8/1/49.

BIDS ASKED—BUILDINGS

Vt., Waterbury—DORMITORY—B.A. 4/8—State, State Bldg. Council State Office Bldg., Montpelier, female dormitory, at State Hospital, $575,000. Webber & Erickson, 56½ Merchants Row, Rutland, archts. CD 12/19.

† **R. I., Davisville**—WAREHOUSE—B.A. 4/15—Pub. Wks. Office, First Naval Dist., 495 Summer St., Boston, Mass., 200x600 ft. rein.-con., rigid frame, masonry dehumidified warehouse, concrete fdn., at Naval Advanced Base Supply Depot, NDY 70851, Spec. 31262. Plans deposit $40. CD 9/13.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

† **U. S. Eng.**, 857 Commonwealth Ave., Boston 15, Mass. cancelled bids to have been opened Mar. 28, fabrication, erection structural steel for double cantilever maintenance hangars Limestone Air Force Base, Eng. 19-016-52-43, LIMESTONE, ME. Will re-advertise. CD 3/12.

† **U. S. Eng.**, 857 Commonwealth Ave., Boston 15, Mass. cancelled bids to have been opened about Mar. 14, fabrication, erection of structural steel for double cantilever maintenance hangars Portsmouth Municipal Airport, Eng 19-016-52-43, PORTSMOUTH, N. H. Will re-advertise. CD 2/13.

MASSACHUSETTS—Commonwealth of Mass., Dpt. P. Wks., 100 Nashua St., Boston.

Kelliher Corp., 33 Walnut St., Turners Falls, Mass. LB $519,132, est. $500,000, hy. and bridge Rte. 155, S 83 (3), Ashfield and Buckland.

Dooley Bros., Inc., 39 George St., Roxbury, Mass. LB $182,361, hy. Cambridge and Washington Sts., Boston. Bids Mar. 11. CD 2/28.

BUILDINGS

LOW BIDS AND CONTRACTS

C. R. Burns & Sons, 21 Doran Rd., Brookline, Mass. LB $589,800, Lakeside SCHOOL, Lakeside Dr., BRAINTREE, MASS. Town R. W. Proctor, Supt. schools, 10 Tremont St., Braintree, Mass. Bids Mar. 12. CD 2/26.

▲ **J. W. Bishop Co.**, 109 Foster St., Worcester, Mass. LB $1,976,900, high SCHOOL.

Eastern Tree & Landscape Corp., 280 Bridge St., Dedham, Mass. LB $69,998, finish grading, seeding and general planting.

Gargalinski Bros., Sterling, Mass. LB $154,594, roads, walks, paving and general grading, HOLDEN, MASS. Wachusett Regional School Dist., Holden, Mass. Bids Mar. 7. CD 2/18.

M. Spinelli & Sons Co., 79 Milk St., Boston, Mass. CA $375,000, twenty-four 109x137 ft. APARTMENTS, eighteen 82x109 ft. APARTMENTS, twenty-four 71x183 ft. garden type APARTMENTS, LYNN, MASS. Nahant Gardens, Inc., 209 Washington St., Boston, Mass. Charles H. Cole, 4 Franklin Rd., Lexington, Mass., archt.

▲ **Farina Bros. Co.**, 429 Watertown St., Newton, Mass. LB $6,375,000, est. $6,000,000. P-104, Contr. 3, state PRISON, NORFOLK, MASS. State, Dpt. Correction, State House, Boston, Mass. Bids Mar. 14. CD 2/12.

▲ **George E. Emerson Co.**, 34 Britton St., Pittsfield, Mass. LB $1,368,000, est. $1,125,000. South Junior High SCHOOL, Pomeroy Ave, William St. and Marshall Ave.;

Carroll-Verge & Whipple, Inc., 370 Wahconah St., Pittsfield, Mass. LB $1,324,851, est. $1,125,000. North Junior High SCHOOL, Springside Park, North St. at Pontoosuc Ave., PITTSFIELD, MASS. City, School Dpt., F. X. Brugger, chn., 43 East St., Pittsfield, Mass. Bids Mar. 12. CD 2/15 and 2/26.

▲ **Dan Deering Co.**, 209 Main St., Norwalk, Conn., LB $2,138,410, Conn.-2-2 federal low rent HOUSING Ely Ave., NORWALK, CONN. City Housing Auth., Norwalk, Conn. Bids Mar. 12. CD 3/7.

▲ **Frouge Constr. Co., Inc.**, 74 Goodsell St., Bridgeport, Conn., LB, $1,047,000, elementary SCHOOL Church Hill Rd., etc. TRUMBULL, CONN. Town Supt. of Schools, Trumbull, Conn. CD 7/18.

▲ **B. Perini & Sons, Inc.**, 73 Montwait Ave., Framingham, Mass., LB, $3,337,000, Conn. 6-1, HOUSING Berkeley Heights, WATERBURY, CONN. City Housing Auth., 24 Warner St., Waterbury, Conn. Bids Mar. 11. CD 2/13.

MIDDLE ATLANTIC

BIDS ASKED—HEAVY CONSTRUCTION

Pa., Mayview—B.A. 4/2—General State Auth., 18 and Herr Sts., Harrisburg, sewage treatment plant, pumping stations, sewer sys., drainage and collection sys. at Mayview State Hospital, $300,000. Plans deposit $10 each. Morris Knowles, Inc., 1312 Park Bldg., Pittsburgh, Zone 22, engr. CD 9/18 under LB.

† **D. C., Wash.**—B.A. 4/10—Office of the Division Engr., Bureau of Rds., Dpt. Commerce, 1440 Columbia Pike, Arlington, Va.

wid'n, 0.745 mi. Constitution Ave. from Virginia Ave. to 26 St., Project 1A3, N. J. Spelman, div. engr.; adv. ENR 3/27.

BIDS ASKED—BUILDINGS

D. C., Wash.—MANAGEMENT BLDG.—B.A. 4/10—National Capital Housing Auth., 1728 L St. N.W., Wash., D. C., construction of management bldg. for Stanton Dwellings Housing Project DC-1-14, Stanton Rd. and Alabama Ave. S.E., Proj. DC-1-14. Plans deposit $20.

▲ **Md., Laurel**—INDUSTRIAL HOME—B.A. 4/15—Distr. Comrs., District Bldg., 14 and Penn Ave. N.W., Wash., D. C., industrial home, $1,950,000.

† **Md., Edgewood**—CLASSIFIED—B.A. On or About 4/16—U. S. Eng., 24 St., and Maryland Ave., P.O. Box 1715, Baltimore, Zone 3, classified bldg., Army Chemical Center, Eng. 18-020-52-38. Plans deposit $5. CD 10/1.

† **Pa., Chambersburg**—MAINTENANCE SHOP—B.A. On or About 4/17—U. S. Eng., 24 St. and Maryland Ave., P.O. Box 1715, Baltimore 3, Md., 242x170 ft. depot maintenance shop bldg., Letterkenny Ordnance Depot, Serial No. ENG 18-020-52-39. Plans deposit $35. CD 2/7, under LB.

† **Md., Aberdeen Proving Ground**—SCHOOL SHOP—B.A. On Or About 4/18—U. S. Eng., 24 St. and Maryland Ave., P.O. Box 1715, Baltimore, Zone 3, 6 school shop bldgs., 2 motive shops, Aberdeen Proving Ground, Eng. 18-020-52-40. CD 10/25.

▲† **N. J., Fort Monmouth**—B.A. About 4/22—U. S. Eng., 80 Lafayette St., New York, 13, N. Y., addnl. facilities, 4 permanent 20 ft. houses, 5 emergency 20 ft. houses, cold storage plant and utilities, $1,250,000. Plans deposit $30. CD 2/19.

SOON LETS CONTRACT—BUILDINGS

Pa., Phila.—HOME—Baptist Home of Phila., Roosevelt Blvd. and Pennypack Circle, soon lets contract home addn., driveway and parking area, $600,000. Horace W. Castor, 117 S. 17 St., archt. Sauter & Castor, 1411 Walnut St., engrs. CD 3/3.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲ **NEW YORK**—Bureau Contracts & Accounts, The Governor Alfred E. Smith State Office Bldg., Albany.

Weber Const. Co. Inc., 133 Wall St., Schenectady, N. Y. LB $295,210, est. $323,000. City of Johnstown; Comrie Ave. (E. Main to Briggs Sts.), City of Johnstown; Briggs St.-North East Ave. (Cayadutta Creek to East City Line), FAC 52-1, Fulton Co.;

Public Constructors, Inc., Ellenville, N. Y. LB $618,441, est. $631,000. 3.03 mi. Frankfort-East Schuyler S.Y. 233, Herkimer-Frankfort, S.H. 458, FARC 52-21, Herkimer Co.;

Hendrickson Bros. Inc., 63 N. Central Ave., Valley Stream, N. Y. LB $1,355,427, est. $1,805,000, 3.75 mi. Sunrise Hy. Ext. (Broadway Ave. to Washington Ave.) FASH 52-3, Suffolk Co.;

Lane Const. Co. Inc., 37 Colony St., Meriden, Conn., LB $3,617,702, est. $4,126,000. 6.2 mi. New York State Thruway, Mohawk Sect. Subdivision 15 (S. Amsterdam By-Pass) Amsterdam-Minaville Pt. 1, S.H. 32; Amsterdam-Morris Corners, S.H. 513; Snooks Corners-Amsterdam Co. R. 22; Morris Corners to S.H. 8338 county road 21; Minaville Street Connection (1.52 mi. access). MT 52-2-RC 52-27, ST 52-5-STC 52-6. Montgomery Co.

received no bids March 12, 4.5 mi. Livingston Manor-Youngsville, Pt. 2 county road, FASS 52-5, Sullivan Co. est. $504,000. CD 2/26.

NEW JERSEY—State Hy. Dpt., 1035 Parkway Ave., Trenton, N. J.; Peter Kiewit Son Inc., 615 North Ave., Lyndhurst, N. J., LB, $830,893, construction of Route 25 A (Section 1H0) from High St. to Broad St. incl. paving, bridges and retaining walls, 0.221 mi. Newark, Essex Co. Bids Mar. 13. CD 2/26.

Felix Clauss & Sons, 4400 N. D St., Phila., Pa., CA $106,840, grading, paving, sewers, Girard Point, PHILA., PA. Gulf Oil Corp., 30 St. and Penrose Ave., Phila., Pa. R. C. Roether, c/o owner, ch. engr.

Baton Constr. Co., 1717 Samsom St., Phila., Pa., CA, bridge, Girard Point, PHILA., PA. Gulf Oil Corp., 30 St. and Penrose Ave., Phila., Pa. R. C. Roether, c/o owner, ch. engr.

† **U. S. Eng.**, First and Douglas Sts. N.W., Wash., D. C. cancelled bids to have been opened Mar. 13, airmen's dormitories, Eng. 49-080-52-43-(41), ANDREWS AIR BASE, MD. Will re-advertise. CD 2/15.

BUILDINGS

LOW BIDS AND CONTRACTS

Vermilya & Brown, Inc., 100 E. 42 St., New York 17, N. Y., CA. Approx. $300,000. BANK alterations, NEW YORK, N. Y. Bowery Savings Bank, 110 E. 42 St., New York 17, N. Y. York & Sawyer, 101 Park Ave., New York 17, N. Y., archts. CD 6/20/50.

▲† **John Rosenblum & Brennan Sloan**, 1860 Broadway, New York, N. Y., LB, $6,061,631, BARRACKS, headquarters bldgs., shops, offices, site improvs., distr. system, sewers, FORT DIX, N. J. Dpt. Army, 121 N. Broad St., Phila., Pa. Bids Feb. 26. CD 1/28.

Carl Metz, 1614 E. Upsal St., Phila., Pa. Separate Contracts, $585,000. RESIDENTIAL DEVELOPMENT, Forest Ave., ABINGTON, PA. Barton & Martin, 12 S. 12 St., Phila., Pa., engrs.

M & E Constr. Co., 1211 Chestnut St., Phila., Pa., CA, $300,000. RESIDENTIAL DEVELOPMENT, Township Line and Drexel Ave., DREXEL HILL, PA. Owner, c/o general contractor.

▲ † **H. Platt Constr. Co.**, 1104 Selinger Ave., Erie, Pa., CA, Approx. $1,750,000. wing for Hamot HOSPITAL, ERIE, PA. Hamot Hospital, 4 E. 2 St., Erie, Pa., Awarded March 13. CD 5/22.

† **H. B. Alexander & Son, Inc.**, 315 Vaughn St., Harrisburg, Pa., LB $676,000. WAREHOUSE, Marietta Transportation Corps Depot, Eng. 18-020-52-31, MARIETTA, PA. U. S. Eng., 24 St. and Maryland Ave., Baltimore, Md. Buchart Engineering Corp., 611 W. Market St., York, Pa., engr.-archt. Bids March 4. CD 2/28.

A. Greenberg, 720 Marlyn Rd. Phila., Pa., Separate contracts, $300,000. RESIDENTIAL development, Oxford Ave., near Loretta Ave., PHILA., PA. Henry S. Berg, 1411 Walnut St., Phila., Pa., archt.

Sam Himelfarb & Son, 5424 Euclid Ave., Phila., Pa., Separate contracts, Approx. $300,000. RESIDENTIAL development, St. Vincent St., PHILA., PA. S. Sherwin Rochlis, 5664 Diamond St., Phila., Pa., archt.

Barkley Homes, Inc., Charles and Passmore Sts., Phila., Pa., CA, $300,000. 2-family RESIDENTIAL development Ryan Ave., PHILA., PA. C. E. Boardman & F. J. Smith, Jr., Charles and Passmore Sts., Phila., Pa. G. Harold Murphy, 1621 Sellers St., Phila., Pa., archts.

Sturm & Co., 4533 N. Front St., Phila., Pa., CA, $700,000 RESIDENTIAL development, Frankfort Ave. and Tabor Rd., PHILA., PA. Sunny Hill Homes Corp., c/o general contractor George Neff, 1520 Locust St., Phila., Pa., archt.

▲ **Elkins Royal Co.**, 8020 York Rd., Elkins Park, Pa., Separate Contracts, Approx. $4,000,000. RESIDENTIAL development, Susquehanna Rd. etc. RYDAL, PA.

John E. Healy & Sons, Inc., 707 Tatnall St., Wilmington, Del., LB, $382,000, SCHOOL, HARRINGTON, DEL. Harrington Special School Dist., Harrington, Del. Bids Mar. 5. CD 2/14.

PROJECTS COVERED

Projects—By Size

Construction projects here reported cover the United States and Canada, are of these minimum sizes or larger: water supply, earthwork, waterways $34,000; other public works $60,000; industrial buildings $82,000; other buildings $300,000.

Classes of Construction
(Name in order of Listing)

Water Supply	Latin America
Sewers, Waste Disposal	Public Buildings
Bridges	Commercial Buildings
Streets & Roads	Industrial Buildings
Earthwork, Waterways	Unclassified

Stages Reported

PROPOSED WORK: Including appointment of engineers or architects.

BIDS ASKED (new announcements only). For full calendar, see also preceding issues of ENR.

LOW BIDDERS: On jobs below $500,000 value all low bidder news, and all the final reports published on the projects involved except where award is not made to the low bidder. In this case, a supplementary contract award report will be published.

CONTRACTS AWARDED: Except awards to low bidders previously reported in low bidder stage.

Dates shown are of issue in which last previous report was published.

Symbols and Abbreviations Include

†	Federal Government
▲	Project of $1,000,000 or over.
B.A.	Bids Asked
ENR	Engineering News-Record
CD	Engineering News-Record Construction Daily

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SOUTH

BIDS ASKED—HEAVY CONSTRUCTION

Miss., Maben—B.A. 4/1—Town, drill 125 GPM water well, 2,200 ft. deep. Plans deposit $5, Leland B. Cook, P. O. Box 290, Tupelo, engr.

† **Fla., Key West**—B.A. 4/2—Dpt. Navy, Key West, paving Pier D-1 at Key West Naval Ordnance Unit, NOY 70687, Spec. 32223. Plans deposit $10.

La., Minden—B.A. 4/3—City, WW and sanitary sewer imprvs. Plans deposit $20 each, E. M. Freeman & Assoc., Continental-American Bank Bldg., Shreveport, engrs. CD 2/5 and 2/6.

Miss., Itta Bena—B.A. 4/3—Mississippi Institutions of Higher Learning, Woolfolk Bldg., Jackson, concrete water tank at Mississippi Vocational College.

Fla., Lauderdale-By-The-Sea—B.A. 4/7—Town, town clk., Lauderdale-By-The-Sea, water mains. Plans deposit $25; 250,000 gal. elevated steel tank and tower. Plans deposit $25; adv. ENR 3/27.

† **Louisiana, Mississippi and Arkansas**—B.A. 4/8—U. S. Eng., P.O. Box 60, Vicksburg, Miss., approx. 36,000 squares asph. upper bank paving at several localities on banks of Mississippi River between Miles 245 and 615 AHP, CIVENG 22-052-52-145. CD 6/26/46 under Louisiana.

La., New Orleans—B.A. 4/14—Charity Hospital, 1532 Tulane Ave., paving area adjacent to west wing of main hospital.

† **Va., Langley Field**—READINESS HANGAR—B.A. 4/15—U. S. Eng., Foot of Front St., P.O. Box 119, Norfolk, Zone 1, 150x230 ft., masonry, block and sheet metal readiness hangar at Langley Air Force Base. ENG 44-110-52-24.

† **Fla., Tampa**—REFUELING SYSTEM—B.A. 4/18—U. S. Eng., 575 Riverside Ave., Jacksonville, Fla., aircraft refueling system, MacDill Air Force Base, Eng. 08-123-52-129B. CD 2/20/50.

† **Florida**—B.A. 4/29—U. S. Eng., P. O. Box 4570, Jacksonville, enlarging channel of Intracoastal Waterway between Oak Hill on Haulover Canal to 12x125 ft., St. Johns, CIVENG 08-123-52-66. CD 11/24/43.

Ky., Danville—B.A. 4/29—City, water treatment plant. Plans deposit $35, J. Stephen Watkins, 251 High St., Lexington, engr.

▲ **Tenn., Knoxville**—B.A. About 5/15—City, City Hall, sewage disposal plant. $5,200,000. Greeley & Hansen, 220 S. State St., Chicago 4, Ill., engrs. CD 2/21.

BIDS ASKED—BUILDINGS

Fla., Key West—SHOP IMPRVS., etc.—B.A. 4/2—Dpt. Navy, Key West, imprvts. to industrial shop NOY 70706, Spec. 32240; naval ordnance unit, NOY 70689, Spec. 32225, both at Key West Naval Station. Plans deposit $10 each.

† **Ga., Albany**—BARRACKS, etc.—B.A. 4/3—Dpt. Navy Officer in Charge of Construction, Box 365, Naval Base, S. C., barracks, mess hall, administration bldg., gate house and entrance facilities, site preparation Marine Corps. Depot of Supplies, NOY 70664. Extended date. CD 2/21.

Miss., Yazoo City—WAREHOUSE-OFFICE—B.A. 4/7—Yazoo Valley Electric Power Assn., Yazoo City, warehouse-office, $115,000, Biggs, Weir & Chandler, 336 Meadowbrook Rd., Jackson, archts.

Miss., Lyons—WAREHOUSE-OFFICE—B.A. 4/8—Coahoma Electric Power Assn., Clarksdale, warehouse-office, $120,000, Biggs, Weir & Chandler, 336 Meadowbrook Rd., Jackson, archts. CD 12/13 under LB.

Fla., Jacksonville—AUDITORIUM, etc.—B.A. 4/9—Duval Co. Bd. P. Instruction, 605 Ocean St., Jacksonville, Fla., auditorium and gymnasium at Ocean Way 62. Plans deposit $25. CD 10/10/49.

† **S. C., Charleston**—BOILER HOUSE—B.A. 4/15—Navy Dpt., Officer in Charge of Construction, Box 365, Naval Base, Charleston, boiler and boiler house at Naval Minecraft Base, NOY 71566. Plans deposit $10. CD 7/5, under LB.

Ala., Tuscaloosa—TRADES SCHOOL—B.A. After 4/15—Alabama State Board of Education, 503 Dexter Ave., Montgomery, trades school, $650,000 Wilmot C. Douglas, 2922 7 Ave. S., Birmingham, Ala., archts.

La., Violet—SCHOOL—B.A. 4/16—St. Bernard Parish School Bd., Chalmette, elementary school. Plans deposit $25, Jones & Roessel, Maxison Blanche Bldg., New Orleans, archts. CD 11/23 under LB.

SOON LETS CONTRACT—BUILDINGS

Ky., Covington—HOSPITAL—St. Elizabeth Catholic Hospital, Diocese of Covington, Covington, soon lets contract, 3 story, brick hospital incl. sewage disposal plant. Plans deposit $50, Potter, Tyler, Martin & Roth, 128 E. 6 St., Cincinnati 1, O., archts. CD 5/22/51.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲† **E. V. Williams Co.**, 1269 E. Princess Anne Rd., Norfolk, Va., LB **$3,247,026.** paving, parking aprons, taxiways, etc. Langley Air Force Base, **LANGLEY FIELD, VA.** U. S. Eng., foot of Front St., Norfolk, Va.

† **J. C. Critcher, Inc.**, Technical Bldg., Asheville, N. C. CA. **$811,748,** extend northeast-southwest runway, Morris Field, Inv. No. 31-079-NG1-Fy-52, CHARLOTTE, N. C. U. S. Property & Disbursing Office, North Carolina National Guard, Bureau Air Force, State Capitol, Raleigh, N. C. Bids March 6. CD 3/13, under LB.

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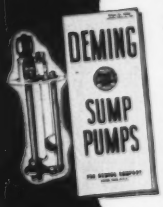

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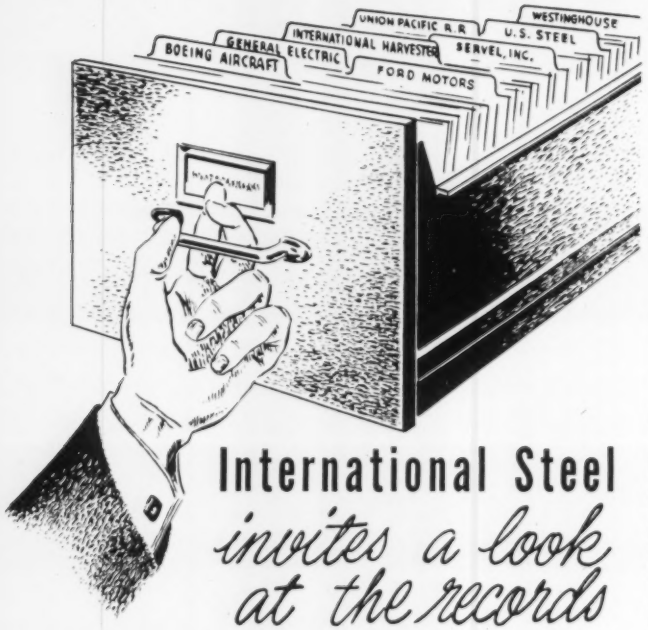

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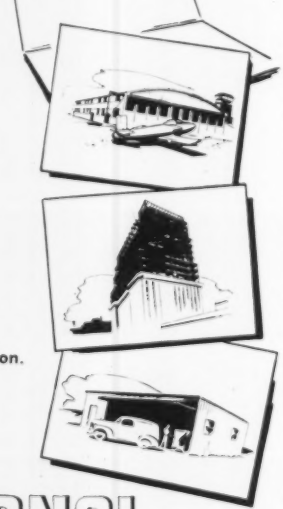

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† Atlantic, Gulf & Pacific Co., 15 Park Row, New York, N. Y., CA, $ 48,980, maintenance dredging, Georgetown Harbor, Georgetown Co. 38-081-52-10. SOUTH CAROLINA. U. S. Eng., Custom House, Charleston, S. C. CD 3/11, under LB.

† Asphalt Paving Co., Coral Gables, Fla., CA, $808,481, reinforcement of airfield pavement at Marine Corps Air Station, NOY 70692, MIAMI, FLA. Sixth Naval District, Charleston, S. C. Bids Mar. 4. CD 3/10, under LB.

▲ Sullivan, Long & Hagerty, 2026 Second Ave., Bessemer, Ala. LB $790,603. Proj. A: LB $1,604,038. Proj. B.

Bartley & Binnings, 433 Gravier St., New Orleans, La. LB $237,473, Proj. C, sanitary sewer imprvs., GULFPORT, MISS. City, Gulfport, Miss. Bids Mar. 13. CD 2/13.

▲ LOUISIANA—State Hy. Dpt., Highway Office Bldg., Baton Rouge.

T. L. James & Co., Ruston, La. LB $998,788, drainage structures three 30 ft., rein.-con. deck girder, span bridge 13,259 mi., Lake Bruin-Somerset Hy., State Rte. 3, S. P. 20-04-11, F. A. Proj. F-67, Tensas Parish; LB $295,298, c. conc. hot mix wearing course 1.341 mi., State Rte. 4, S. P. 1-03-18, F. A. Proj. F 385, Bossier Parish.

Barber Brothers Co., 2636 Dougherty Dr., Baton Rouge, La. LB $374,810, drainage structures, c. conc. 7.219 mi., Ellensale-Schriever, Hy., State Rte. 79 and 82, S. P. 413-01-07 and 855-03-05, F. Secondary Proj. S-118, Terrebonne Parish. Bids Mar. 12. CD 2/18.

Twin Lakes Telephone Co-operative, Gainesboro, Tenn. Owner builds. Approx. $573,000, telephone lines, GAINESBORO, TENN.

BUILDINGS

LOW BIDS AND CONTRACTS

▲ Frank H. Conner Co., 711 S. Tryon St., Charlotte, N. C. CA, $1,141,000, 190 HOUSING units, NORFOLK, VA. Norfolk Redevelopment & Housing Auth., 500 Dickson Bldg., Norfolk, Va. Bids March 11. CD 2/13.

▲ Daniel Const. Co., 429 N. Main St., Greenville, S. C. CA. Approx. $1,000,000, hosiery MILL, LIBERTY, S. C. Julius Kayser & Co., c/o contractor.

Potter-Shackleford Const. Co., Allen Bldg., Greenville, S. C., CA. Approx. $500,000, MILL addns., ROCK HILL, S. C. Rock Hill Printing & Finishing Co., Rock Hill, S. C. CD 3/30/45.

Osceola Constr. Co., Mobile Hwy., Pensacola, Fla., CA $504,500, HOUSING Projects, GA 135-1 and GA 135-2 HOGANSVILLE, GA. Hogansville Housing Auth., Hogansville, Ga. Bids Mar. 11. CD 2/7.

▲ Fred Howland, Inc., 1451 N. W. 20 St., Miami, Fla., CA, $1,374,959, 190 unit HOUSING project, ORLANDO, FLA. Orlando Housing Auth., 1607 E. South St., Orlando, Fla. Bids Mar. 11. CD 2/7.

▲ Batson-Cook Co., West Point, Ga., CA, $3,843,450, HOUSING Project Ala. 2-3, 493 units MOBILE, ALA. Mobile Housing Auth., P. O. Box 1345, Mobile, Ala. Bids Mar. 11. CD 2/7.

▲ Cowan-Irvine Co., 61 St. Francis St., Mobile, Ala. Owner Builds, $1,000,000 112 RESIDENCES, MOBILE, ALA.

Montgomery Housing Auth., 130 Bell St., Montgomery, Ala., cancelled bids to have been opened Mar. 26. 390 unit housing project, Ala. 6-6, MONTGOMERY, ALA. CD 2/12.

Perkins & Gray, Ashland, Ky. CA $843,000, 99 HOUSING units, RICHMOND, KY. Richmond Municipal Housing Comn., Richmond, Ky. CD 2/1, under LB.

▲ S. & W. Constr. Co., Sheine Bldg., Memphis, Tenn., CA $3,349,733, 450 unit HOUSING, Project Tenn 1-6, Jackson and Thomas Sts., MEMPHIS, TENN. Bids Feb. 29. CD 2/8.

Rentenbach Engineering Co., 406 W. 5 Ave., Knoxville, Tenn., CA, $417,700, HOUSING Projects, Tenn 18-1 and 18-2, ROCKWOOD, TENN. Rockwood Housing Auth., Rockwood, Tenn. Bids March 13. CD 2/21.

▲ Jack Saunders, Waverly, Tenn. Owner builds. Approx. $2,000,000. 300 RESIDENCES, WAVERLY, TENN.

MIDDLE WEST

BIDS ASKED—HEAVY CONSTRUCTION

▲ Ind., Fort Wayne—B.A. 4/8—Bd. P. Wks., City Hall, waterworks imprvt., 4,750 ft. 30 in., 13,160 ft. 23 in., 3,600 16-in. watermains, $6,000,000. Drury-McNamee and Porter, 103 E. Washington St., Ann Arbor, Mich., consult. engrs. CD 2/4/49

BIDS ASKED—BUILDINGS

Wis., Milwaukee—MEDICAL SCHOOL ADDN.—B.A. 3/31—Marquette University, 615 N. 11 St., Milwaukee 3, Wis., medical school addn., $700,000. Extended date. CD 3/14

† Ill., Great Lakes—OFFICE, etc.—B.A. 4/8—Dpt. Navy, Ninth Naval Dist., Great Lakes, Ill., 4 story, brick, rein.-con. 157x422 ft., office bldg. and supply depot, $4,000,000; Childs & Smith, 20 N. Wacker Dr, Chicago, 6, Ill., archts. CD 1/3

▲ O., Toledo—JUVENILE COURT, DETENTION HOME—B.A. 4/8—Charles H. Austin, Secy., Building Comn., Court House, 4 story bsmnt., juvenile court and detention home bldg., Michigan and 10 Sts., $1,205,460; 1 story court bldg., $175,010, playground $60,000. Plans deposit $25. Bellman, Gillet & Richards, 518 Jefferson St., archts. CD 8/10 under LB.

CONTRACT
OK
FULFILLED
This "string shot"
really paid off!
Williams Brothers Company of Tulsa, Oklahoma, knew they could eliminate worries over drilling if they could ditch the Catawba River near Charlotte, North Carolina with a string shot. They knew, too, that a string shot must be *just right* to pay off.
Atlas sales-technical men cooperated on the job. The 500-foot shot in water as deep as 38 feet required 20,000 pounds of Atlas 90% Gelatin loaded in 25-pound cartridges. The loading formula recommended proved just right: there was no delay in dredging . . . no re-shooting needed here. Another "Contract Fulfilled" chalked up for Atlas products and Service.
ATLAS EXPLOSIVES
ATLAS
"Everything for Blasting"
ATLAS POWDER COMPANY • WILMINGTON 99, DELAWARE
Offices in principal cities
New York . . Joplin, Mo. . . Chicago, Ill.
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Hammering Down H-PILES for New-Design Canadian Bridge

A new bridge across the Stave River in British Columbia is the first of its type in the world. This steel-truss structure is carried on piers and abutments of steel H-pile and Prepakt-concrete design, which results in less construction time and lower costs than by conventional methods. Naturally, the contractor selected a McKiernan-Terry Double-Acting 9-B-type hammer to drive the vital H-piles.

Samples taken below the river bottom indicated that pile driving conditions were not ideal. Piles had to be hammered to refusal in silt and varying layers of coarse and fine sand. The McKiernan-Terry hammer, however, quickly drove 75-ft batter piles to desired penetration—with the piles projecting up into the Prepakt-concrete.

No matter what your pile driving job, you can count on the power and dependability of McKiernan-Terry pile hammers and extractors. Complete McKiernan-Terry line includes 16 sizes of hammers and 2 sizes of extractors. Write for bulletin, giving full details.

Other McKiernan-Terry Products

MEAD-MORRISON COAL AND ORE UNLOADERS AND BRIDGES

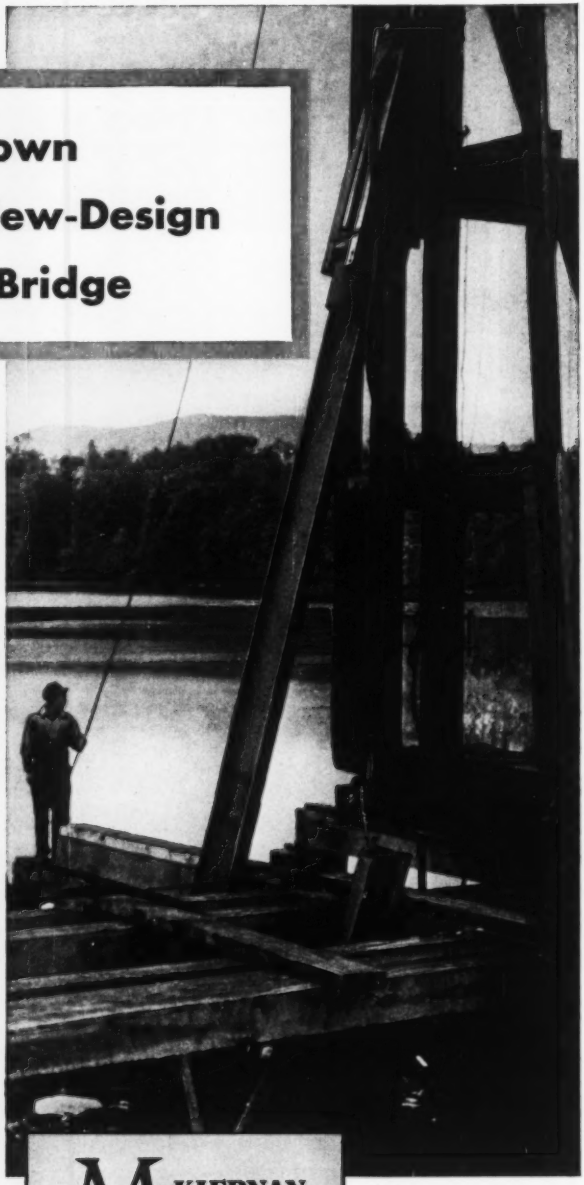
Available in a variety of designs and in capacities of 300 to 1500 tons per hour. Exceptional durability proven by installations in service for half a century. Simple controls afford convenient, comfortable and speedy operation.

GRAB BUCKETS

Range of types and sizes take bulk materials loads up to 25 tons. Ruggedness without excess weight.

HONING UP TO 42-IN. I.D. X 55-FT. LONG

Typical of the extensive facilities of McKiernan-Terry for unusual jobs.



McKiernan-Terry Double-Acting 9-B-type Pile Hammer driving batter piles for the Stave River bridge in British Columbia. Northern Construction Company & J. W. Stewart Limited was the contractor.

McKIERNAN TERRY

McKIERNAN-TERRY CORPORATION • MANUFACTURING ENGINEERS • 13 PARK ROW, NEW YORK 38, N. Y.

Plants: Harrison, N. J. and Dover, N. J.

MK317

▲ Ill., Lincoln—HOSPITAL—B.A. 4/15—Memorial Hospital Assn., Walter A. Faster, pres., 5 story brick, concrete, Abraham Lincoln Memorial Hospital. $1,250,000. Fugard, Burt & Wilkinson, 520 N. Michigan Ave., Chicago, Ill., archts., Deal, Deal & Trutter, Lincoln, assoc. archts. CD 7/28/50.

Wisc., Menomonie—LIBRARY—B.A. 4/17—Stout Institute Menomonie, 1 story, bsmnt., 103x104 ft., brick, stone library, $503,000. Plans deposit $25. Fueller, Schober, Berners, Safford & Hand, 310 Pine St., Green Bay, Wis., archts., R. C. Kirchhoff, Madison, state archt. CD 2/11

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲ OHIO—State Hy. Dpt., T. J. Kauer, highway engr., Columbus,

The Koski Const Co., National Bank Bldg., Ashtabula, O., LB **$67,455,** est. $68,750, Type T-35 3.858 mi. C.R 19, S-470 (1), Ashtabula Co.;

Ruckman-Hassen, inc., 3617 Leo Rd., Fort Wayne, Ind., LB **$374,236,** Type T-35 on B-70 and structure, 0.55 mi. U.S. R. 36 (10.40-10.73). U-982 (2), Delaware Co.;

John H. Murnane Co., 802 E. 67 St., Cleveland, O., LB **$162,145,** T-35 on B-20 and structure 0.288 mi. CR 83, QS-296 (1), Trumbull Co.;

D. R. Smalley & Sons, Inc., 426 W. Market St., Celina, O. LB **$648,098,** Type T-71 and structures 2.246 mi. SR 73-(15.01-15.15). S-45 (2), Warren Co.;

Great Lakes Const Co., Box 2278 Brooklyn Station, Cleveland, O., LB **$109,931,** Type T-71, 0.328 mi. USR 6-7.23, Cuyahoga Co.;

Herman B. Hune, Williamstown, W. Va., LB **$77,950,** Type T-32 on SS-5 and structure, SR 160-14.30, Gallia Co.;

Frysinger Const Co., 16 E. Broad St., Columbus, O., LB **$166,762,** Type T-32 6.139 mi. SR 314-(19.97-23.98) Morrow Co.;

Ohio Road Improvement Co., Chamber Commerce Bldg., Columbus, O., LB **$73,295,** Type T-35 1.473 mi. SR 153 (5.93-7.37), Stark Co. Bids Mar 11. CD 2/28.

OHIO—State Hy. Dpt., T. J. Kauer, Dir., Columbus, Zone 15, Kelley & Meyer, 1211 Gibson St., Youngstown, O., LB **$358,883,** B. conc. 0.7 mi. Rte. 341 and 2.7 mi. Rte. 341 in Unity Twp., Columbiana Co. and 1.5 mi. Rte. 90 in Springfield Twp. and New Middletown, Mahoning Co. Bids March 11. CD 2/28.

Neighborgall Const. Co., Huntington, W. Va., LB **$346,900,** sewage treatment plant for Veterans Admin. Hospital and U. S. Federal Reformatory, CHILLICOTHE, O. Veterans Admin., Vermont Ave. between H and I Sts., N.W. Wash. 25, D. C. Bids March 11. CD 2/6.

R. G. Mattern, 2310 N. Western St., Dayton, O., LB **$73,730,** est. $77,408, sanitary sewer for "Happy Hollow" area of North DAYTON, O. City, Municipal Bldg., Dayton, O. Bids Feb. 14. E. L. Pollard, Supt. of Sewers. CD 2/4.

Freeman Jones Const. Co., 6007 Euclid Ave., Cleveland, O. CA. Approx. **$227,000.** WW improv. to triple amount of water storage at station and increase treatment facilities, KENT, O. City, City Hall, Kent, O. Awarded March 4. CD 8/14/50.

W. A. Hodson, Highland, O., CA. $229,831, erect stone breakwater along east bank of Lake St. Marys, 40 ft. wide at bottom and 8 ft. at top. ST. MARYS, O. Ohio Dpt. P. Wks., S. O. Linzell, Dr., Columbus, O. Bids Dec. 26. CD 12/5.

WISCONSIN—State Hy. Comn., Madison, Wis. Edward Kraemer & Sons, Plain, Wis., LB **$186,138,** Contract 1, Structure B-13-18, the Oregon-Madison (Clayton subway) Road, U.S. Hy. 14 and S.T. Hy. 13. Proj. F 0014-2 (9), Dane Co. Bids Mar. 11. CD 2/21.

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **Emil Muller Const. Co. Inc.,** 911 Commerce Bldg., Rochester N. Y. CA Approx. $2,000,000. SHOPPING CENTER, on 12 acre site at northeast corner Wooster and Hawkins Ave., Sect. 1, 668 ft. wide for 20 stores; Sect. 2, 2-story bldg., 450 ft. wide. AKRON, O. National Plazas, Inc., c/o contractor. 3/27/52.

Sever-Williams Co., Washington Court House, O., CA. $650,600, general const. HIGH SCHOOL, FAIRBORN, O. Bd. Educ., Fairborn City School Dist., N. Central Ave., Fairborn, O. Bids Feb. 21. Awarded Feb. 21. CD 1/22.

H. L. Vokes Co., 1000 Wayside St., Cleveland, O., CA. $150,000, design and construct 1 story 165x242 ft. brick, concrete, steel WAREHOUSE, Dura Ave., TOLEDO, O. Lane Drug Co., 397 Phillips Ave., Toledo, O. Awarded March 6.

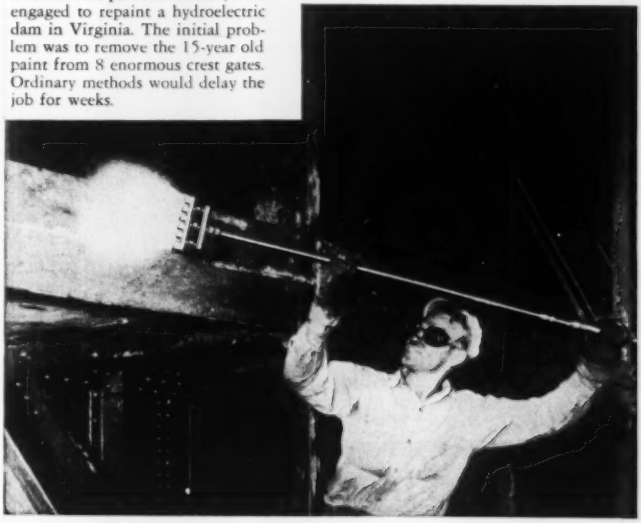
▲ **D. D. Davis Const. Co.,** 5234 Glenwood Ave., and Jim Andio & Sons Excavators, 7755 Market St. Ext., both Youngstown, O., CA. Approx. $1,000,000. 100 HOMES on 63-acre site in Hubbard Rd.-Jacobs Rd. area, named Hubbard Manor, YOUNGSTOWN, O. Westview Heights, Inc., c/o contractor.

Russell Pfaff Const Co., 127 Melrose Ave., Youngstown, O., CA. $85,000, 95x195 ft. FACTORY addn., mfg. aluminum parts for aircraft, YOUNGSTOWN, O. General Extrusions Co., 4040 Lake Park Rd., Youngstown, O.

† **Greene & Gust Co.,** 1154 W. Lunt St., Chicago, 26, Ill., CA, $899,999, HOUSING Project, 190 units, CAMP ATTERBURY, IND. Public Housing Admin., 201 N. Wells St., Chicago, Ill. Bids Feb. 28. CD 3/17, under LB

Flame cleaning speeds 'face lifting' on giant dam

MILLER CONTRACTING CO. OF OHIO, INC. located in Canton, a nationwide paint contractor, were engaged to repaint a hydroelectric dam in Virginia. The initial problem was to remove the 15-year old paint from 8 enormous crest gates. Ordinary methods would delay the job for weeks.



G. E. Hartwick, Airco Technical Sales Representative, suggested oxyacetylene flame cleaning with Series 9200 Torches and Airco Style 120 tips. Quickly and easily applied, the intense heat of the flame cockled the old paint, loosened scale and drove off surface moisture in a single operation.

The Miller Contracting Co. found that a flame cleaned surface made for a better finished paint job. An executive said, "We're convinced that flame cleaning is the most efficient and economical method of preparing steel surfaces prior to painting. We now use it almost exclusively for removing rust and scale."

• • • • •

TECHNICAL SALES SERVICE—ANOTHER AIRCO PLUS-VALUE FOR CUSTOMERS

Technical Sales Service—though not a packaged commodity—is as readily available to all industry as any Airco process or product. If you have a metal working problem, ask to have a Technical Sales Division man call. Write your nearest Airco office.

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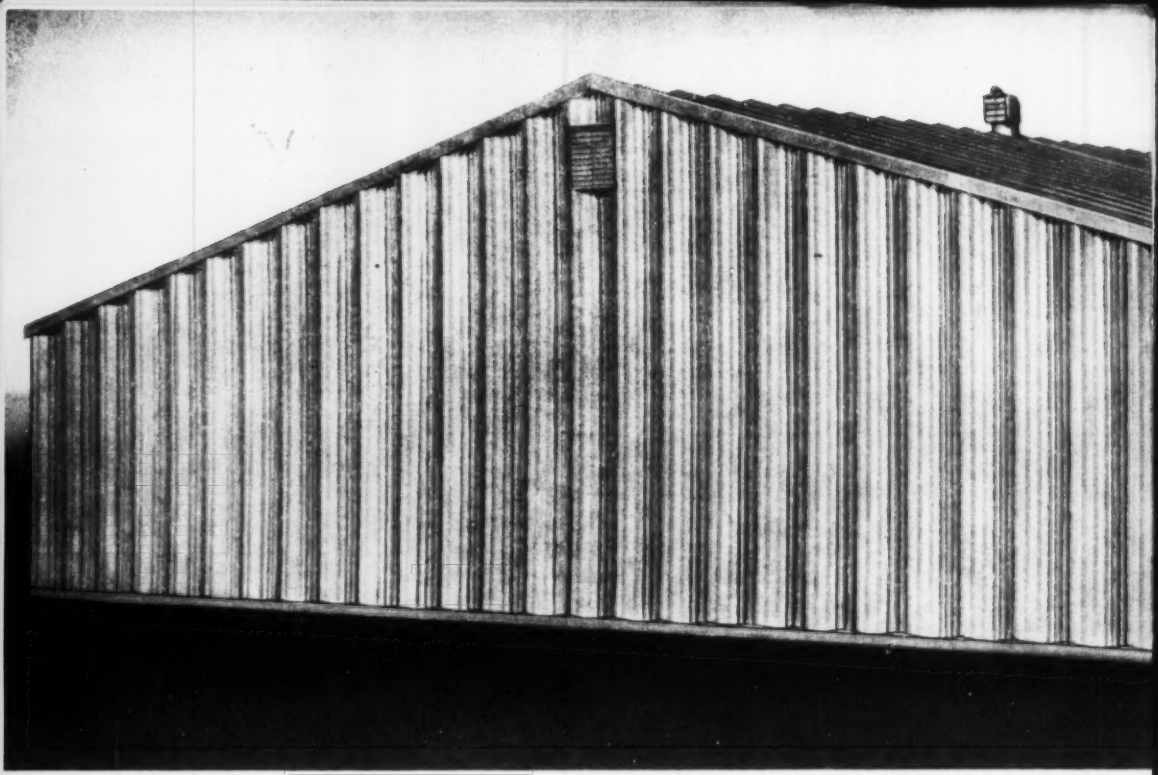
Divisions of Air Reduction Company, Incorporated
Offices in Principal Cities



Huge pre-fab with single span roof proves big future

Recently completed Warehouse for Union Stockyards Company of Omaha is 100′x552′x17′. Erected in 48 Working Days in Adverse Weather.

The world's second largest stockyards bet on a "comer" in the building field last December. Today, that "comer" looks like it has arrived.

When the board of directors of the Union Stockyards Company of Omaha decided to erect a permanent warehouse for storage rental, all types of construction were investigated. After due consideration of purchase price, maintenance cost, and permanence, the contract was awarded for a 100′x55-′x17′ Behlen Frameless Metal Building.

• **Frameless pre-fabs**—Relatively new as builders, the Behlen Manufacturing Company is largely noted for its modern farm equipment. However, since early 1950, it has been working on a new type pre-fabricated building.

The Behlen Research Department met with considerable success in developing and proving the advantages of monocoque sheet metal construction. All costly framework was eliminated in erecting some 40 buildings up to 52-ft. wide. With the same principles of self-support as a basis, the 100-ft. wide Omaha stockyards building was designed with only limited structurals to support the increased roof load. The horizontal wind load is transferred to the footings through the monocoque shell of the building.

• **Huge Capacity**—The warehouse is divided into three storage bays; one is 100′x195′ and the other two are 100′x178′. The total storage capacity is estimated at 500 carloads, or the equivalent of a train-load four miles long.

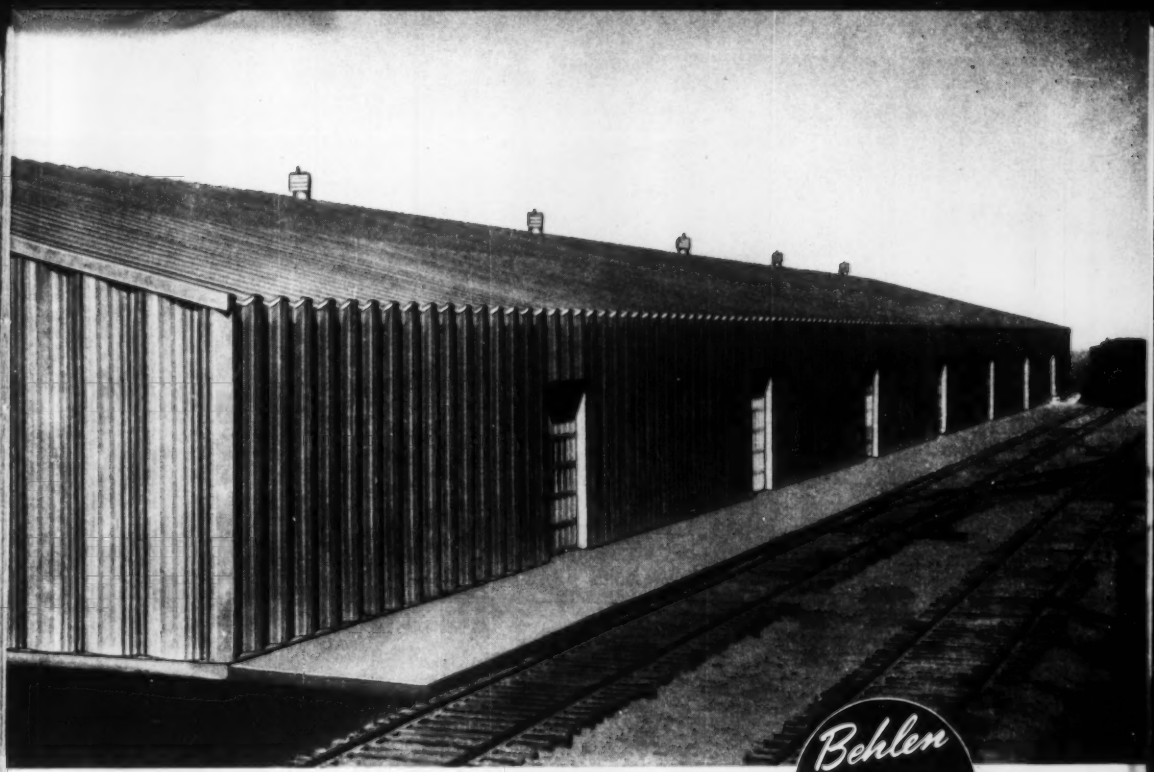
The Mainelli Construction Company, Omaha, put the building up in just 48 working days in winter weather. The erection crew's main job was assembling and bolting together the pre-fabricated 43-in. wide 13 gage aluminum panels that had been cut, gang-punched, and corrugated at the Behlen factory.

• **Monocoque Construction**—In frameless (Monocoque) construction, the walls and roof are made of deep corrugated sheet metal panels. These panels are bolted together at the eaves and roof ridge to form complete arches or rigid frames. The sheet metal arches are in turn bolted to each other to

Behlen

MANUFACTURING

Metal Buildings Division



for Monocoque Construction

Behlen FRAMELESS METAL BUILDINGS Pat. Pending

form a complete monolithic, weatherproof, load-bearing shell.

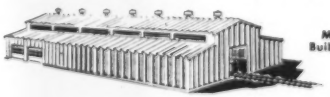
An important advantage of Behlen Frameless Metal Buildings in narrower widths is that no trusses or columns are used. This means unobstructed, wall-to-wall space for storage or other use.

• **Future, Unlimited**—All Behlen Buildings are custom-made for each job. They are not limited to standard sizes.

Referring to their new Omaha structure, Designer W. D. Behlen said, "This new application of reinforced Monocoque Construction in large buildings makes possible single gable roofs up to 200-ft. wide without the usual snow, ice, and drainage problems of multiple-unit construction."

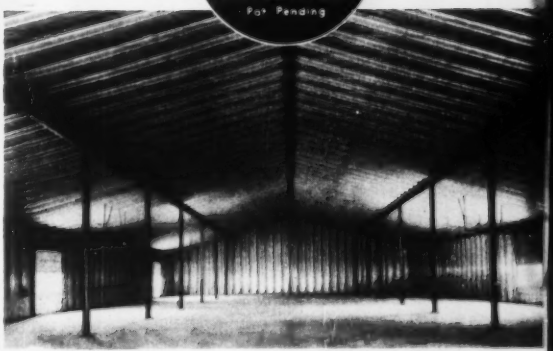
* * * *

Write or wire for more information, or estimates on construction in which you may be interested.



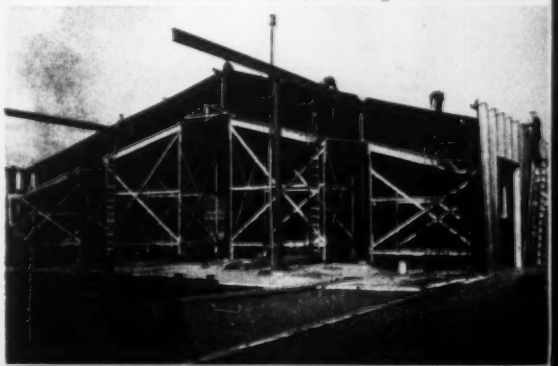
COMPANY

Columbus, Nebraska



ABOVE—Center bay is 100′x195′. Note limited use of structural memb made possible by Monocoque Construction of the building shell.

BELOW—Erection crew at work; scaffolding is caster-mounted.



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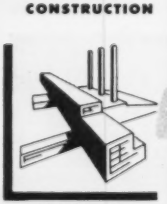
MARINE CONSTRUCTION

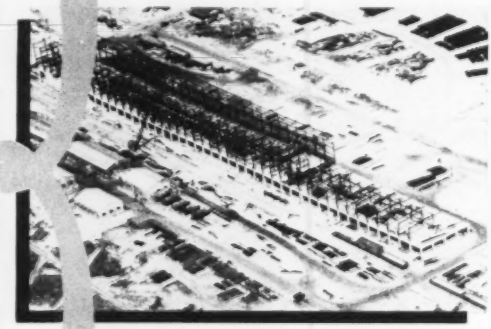
HEAVY CONSTRUCTION



INDUSTRIAL CONSTRUCTION

BUILDING CONSTRUCTION

The versatile skills that Merritt-Chapman & Scott brings to your construction problems are the result of *specialized* experience on all types of industrial, building, marine and heavy construction projects. In each of these varied fields, the MC & S record of accomplishment is impressive.



Portion of one of 2 sulphate pulp and paper mills currently under construction in Florida for the St. Regis Paper Company.

For example, in the fields of industrial and building construction, MC & S has completed *55 major* construction projects in the last 5 years. And 38 of these represented repeat contracts awarded by clients previously served by MC & S.

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▲ Thorp Constr. Co., 701 N. Main St., Evansville, Ind., LB, Type A, $1,535,000; Type B, $1,410,500 HOUSING project, EVANSVILLE, Ind. Evansville Municipal Housing Auth., City Hall, Evansville, Ind. Bids Mar. 6. CD 2/27.

Berling & Son, 212 S. Temple St., Indianapolis, 1, Ind., LB, $395,000, brick, stone, rein.-con. grade school 71, Emerson Ave. and 34 St., INDIANAPOLIS, IND. Bd. School Comrs., 150 N. Meridian St., Indianapolis, Ind. Bids Mar. 11. CD 3/4.

Lloyds Builders Inc., 61 West Superior St., Chicago, 19, Ill., LB, $638,400 on Project Ill. 35-1.

Kuchard & Assocs., Inc., 225 Jewett Bldg., Des Moines, Ia., LB, $663,600, Ill 35-1 and 35-2, combined, 76 dwelling units, and management bldg. on site of Proj. Ill. 35-1 and about 2½ miles away 4 dwelling units on site for Proj. Ill 3-52, etc., DIXON, ILL. Lee County Housing Auth., Treasurer Council Room Dixon City Hall, Dixon, Ill. Bids Mar. 12. CD 2/5.

Stanley A. Nelson, 543 W. 79 St., Chicago, 20, Ill., LB, $776,640, high SCHOOL, MIDLOTHIAN, ILL. Bremen Community High School District, 16915 S. Oak Park Ave., Midlothian, Ill. Bids Mar. 4. CD 2/19

WEST OF MISSISSIPPI

BIDS ASKED—HEAVY CONSTRUCTION

† Missouri—B.A. on or about 4/1—U. S. Eng., 601 Davidson Bldg., Kansas City, Mo., repair, stabilization of flood damaged Mace-Villon Creek Channel, Missouri River Agriculture Levee No. 476-L, Andrew Co., approx. 6 mi. north and west of St. Joseph, CIVENG 23-028-52-164. CD 6/1/44.

† Tex., Austin—BASE OPERATIONS BLDG.—B.A. 4/2—U. S. Eng., 606 Santa Fe Bldg., Galveston, 7 story masonry type base operations bldg. and central telephone exchange bldg., Bergstrom Air Force Base, $500,000. Bids date changed. CD 3/5.

▲† Tex., Austin—DORMITORIES—B.A. 4/3—U. S. Eng., 606 Santa Fe Bldg., Galveston, ten 3-story masonry airmen's dormitories with all appurtenances, at Bergstrom Air Force Base, Inv. No. ENG 41-243-52-75. Approx. $1,000,000. Bid date changed. CD 3/5.

Missouri—SUBSTATIONS—B.A. 4/7—Central Electric Power Co-operative, Linn, two 30,000 KVA 161/69 KV sub stations, Wright and Maries Counties. Plans deposit $25. Frank Horton & Co., Lamar, engrs. CD 12/1/49.

† Okla., Altus—WATER SYSTEM—B.A. 4/8—U. S. Eng., Box 61, Tulsa, water distr. sys. addn., fabricate erect 250,000 gal. elevated steel water storage tank, construct c.i. water supply line, at Altus Air Force Base, Eng 34-066-52-52. CD 1/24.

† Mo., Grandview—FIRE STATION, etc.—B.A. 4/10—U. S. Eng., 601 Davidson Bldg., Kansas City 8, Mo., combined crash and structural fire station, base operation, control tower, readiness bldg., maintenance hangar with shops, Grandview Air Force Base, Burns & McDonnell Engineering Co., 95 and Troost Sts., Kansas City, Mo., consult. engrs. CD 1/15.

† Minn., Minneapolis—ALERT HANGAR—B.A. 4/11—U. S. Eng., 1709 Jackson St., Omaha, Neb., alert hangar at Wold-Chamberlain Air Force Base, Inv. 52-67. CD 3/11.

† North Dakota and Montana—B.A. On Or About 5/15 U. S. Eng., Fort Lincoln, P.O. Box 300, Bismarck, gage installations at head of Garrison Reservoir, 9 gages in Williams and McKenzie Counties, N. D. and Richland Co., Mont. Serial No. CIVENG 52-015-52-38. CD 6/1/44, under North Dakota.

Tex., San Antonio—Bids Asked—Fred W. Davis, 1210 Main St., Dallas, water lines, facilities, $40,000, (Second unit). J. W. Beretta Engineers, Travis Bldg., engrs. CD 2/25.

Tex., San Antonio—Bids Asked—Fred W. Davis, 1210 Main St., Dallas, storm sewers, $60,000; sanitary sewers, $65,000, (Second unit). J. W. Beretta Engineers, Travis Bldg., engr. CD 2/25.

Tex., San Antonio—Bids Asked—Fred W. Davis, 1210 Main St., Dallas, streets, construction and asph. paving, $70,000. J. W. Beretta Engineers, Travis Bldg., engrs. CD 2/25.

BIDS ASKED—BUILDINGS

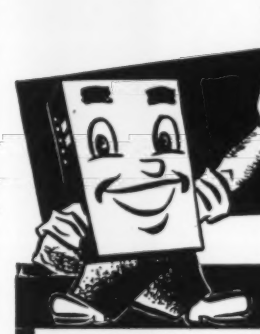
Neb., Omaha—HOSPITAL—B.A. 4/1—Nebraska Methodist Hospital, 3612 Cuming St., hospital addn. $500,000. L. J. Dworak, 621 J. E. George Blvd., archt. CD 1/28.

† Mo., Independence—BUILDING—B.A. 4/10—U. S. Eng., 601 Davidson Bldg., Kansas City 8, Mo., permanent type bldg. No. 35 Lake City Arsenal, Eng. 23-028-52-49.

▲ Tex., Lubbock—CHURCH—B.A. 4/15—First Methodist Church, Lubbock, church and educational, $1,200,000. Wyatt C. Hedrick, 1005 First Natl. Bank Bldg., Fort Worth, engrs.-archts. (Correction—status). CD 3/4, under CA.

Tex., Dallas—HOUSING—B.A. 4/22—Navy Dpt., c/o R. E. Bassler, (CEC) USN, Dst. P. Wks. Office, Eighth Naval Dist., Bldg. 16, U. S. Naval Station, New Orleans, La., construct, manage, finance, 129 unit Wherry Housing Proj. NOY 23154. FHA Proj. No. 212-80004-Navy-1. $967,500. CD 3/7.

▲ Neb., Omaha—AUDITORIUM—B.A. 4/25—City, City Hall, 18 and Farnam Sts., municipal auditorium, $6,000,000. L. A. Daly Co., Insurance Bldg., archts. CD 1/11/51.

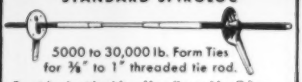


UNIVERSAL CONCRETE ACCESSORIES "TOPS" IN CONCRETE FORMING

A COMPLETE LINE FROM 1 SOURCE

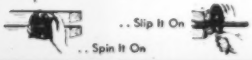
FORM TIES

STANDARD SPIROLOC



5000 to 30,000 lb. Form Ties for ⅜" to 1" threaded tie rod.

Furnished with either Handle or Nut Type Washers



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Provides 5,000 to 30,000 lb. form ties

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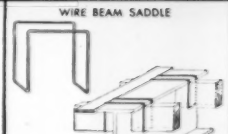
A Combination Form Tie and Positive Spreader Breaks-off 1" back of the wall face.

***The* FORM CLAMP**

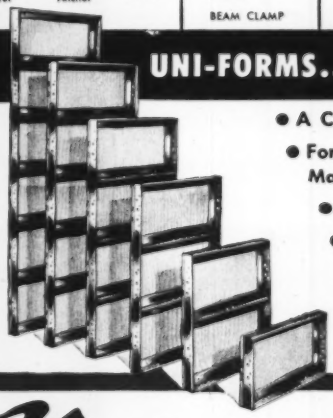
Provides tremendous holding power with The Sure Grip Principle

BUILDING SPECIALTIES



BAR SUPPORTS

UNI-FORMS... "TOPS" IN CONCRETE FORMING



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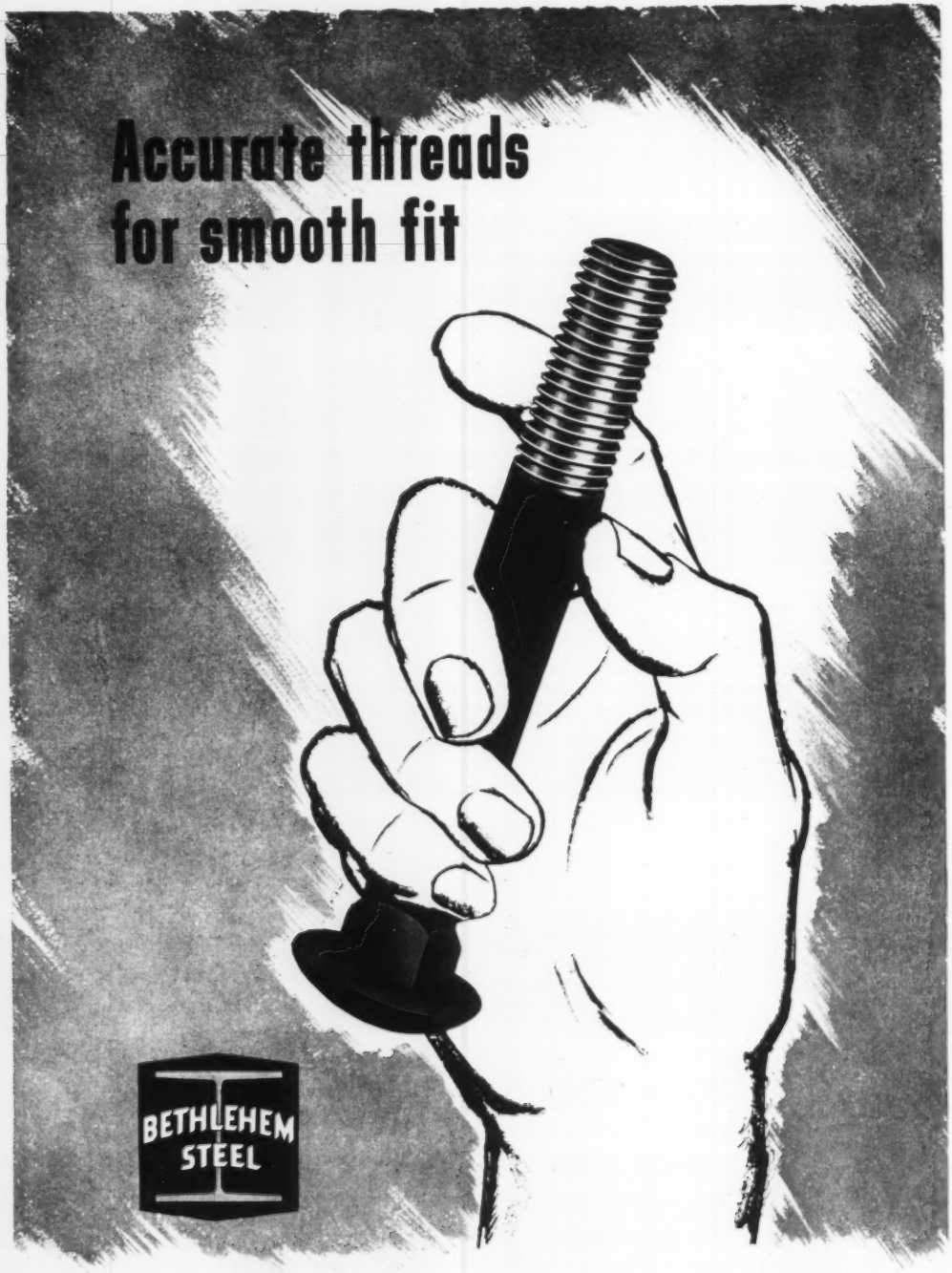


Bethlehem supplies every type of Fastener

▲ Okla., Ponca City—REFINERY, etc.—Bids Asked—Continental Oil Co., Ponca City, higher octane gasoline refinery unit, $3,550,000; high-pressure steam boiler plant unit, $350,000; electric turbine generator unit, $2,000,000; auxiliary facilities for power plant, $400,000. CD 1/4.

Tex., Houston—PARKING GARAGE—Bids Asked—City, City Hall, 900 Brazos St., large private auto parking garage. Approx. $300,000.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

J. A. Tobin Constr. Co., 3700 Rainbow St., Kansas City 3, Kan. LB $168,785, est. $175,000, paving Manchester Trafficway from Chouteau Bridge to Garner Ave., KANSAS CITY, MO. City, Dpt. P. Wks., City Hall, Kansas City 6, Mo. Bids Mar. 4. CD 2/20.

▲ McAlister-Davis Co., 833 State St., Pine Bluff, Ark., CA, $1,746,50, 31,000 lin. ft. bank protection on Mississippi River between Wickliffe Ky. and Cow Island Bend, Inv. 52-57, ARKANSAS AND KENTUCKY. U. S. Eng., P.O. Box 97, Memphis, Tenn. Bids Mar. 4. CD 1/24.

† Mississippi Valley Engr. & Constr. Co., 787 S. Willett St., Memphis, Tenn., LB, $244,672, est. $206,190, bank stabilization program, ENG 03-050-52-23, Dardanelle Yell Co. ARKANSAS. U. S. Eng., 300 Broadway, Little Rock, Ark.

KANSAS—State Hy. Comn., Russell,
Blair Brothers Constr. Co., Quinter, Kan. CA $85,499, bridge 25-55.24-4, Sta. 203 plus 20, 36 ft., six 45 ft., 36 ft. continuous rein. con. slab spans. Proj. 25-55 S 151 (1), Logan Co. Bids Feb. 29. CD 2/15.

KANSAS—State Hy. Comn., Salina,
Adrian Schweitzer, Osborne, Kan. CA $119,904, grading 4.893 mi., Proj. 281-84 F 035-3 (1), Russell Co. Bids Feb. 29. CD 2/15.

† List & Clark Constr. Co., Railway Exchange Bldg., Kansas City 6, Mo. CA $736,585, levees and diversion canal, Arkansas River and Cow Creek, near Hutchinson, Inv. 52-37, KANSAS. U. S. Eng., P.O. Box 61, Tulsa, Okla. CD 2/14, under LB.

▲† Walden, Fulton & Payne Constr. Co., Lubbock, Tex. CA $3,579,547, 26 buildings, Smoky Hill Air Force Base, Eng. 23-028-52-21, SALINA, KAN. U. S. Eng., 601 Davidson Bldg., Kansas City 8, Mo. Bids Feb. 8. Awarded Mar. 7. CD 2/14 under LB.

Pelphrey-Basham, Electric Bldg., Fort Worth, Tex., LB $43,015, water lines, ARLINGTON, TEX.-City, Arlington, Tex. Bids March 4. CD 12/28.

Herman W. Holtzer, 1700 Rogers St., Fort Worth, Tex., LB $79,605, sanitary sewers, ARLINGTON, TEX. City, Arlington, Tex. Bids March 4. CD 11/21.

▲† Barfield Constr. Co., 3108 Pierce St., Amarillo, Tex. CA, $950,139, Group 1, dormitories, messes and administration, CA $654,794, Group 2, dormitories, messes, Inv. No. Eng. 41-243-52-54, at Laughlin Air Force Base, DEL RIO, TEX. U. S. Eng., 606 Santa Fe Bldg., Galveston, Tex. Bids March 4. Awarded March 12. CD 3/10.

Worth Const. Co., Box 531, Fort Worth, Tex., LB $160,000, 1,600 lin. ft. concrete retaining wall, FORT WORTH, TEX. Consolidated-Vultee Aircraft Corp., Grant Lane, Fort Worth, Tex. F. C. Clayton, plant engr. Bids March 12. CD 2/13.

City, Harlingen, Tex., Purchase and Hire, $45,000, some c.i. water distr. lines; $55,000, some water sys. rehabilitation work, HARLINGEN, TEX. K. R. Caldwell, city engr. CD 11/5.

† W. L. Ridge, Hutton Bldg., Spokane, Wash. CA $671,777, Inv. 6317 Schedule 2, Hot Springs-Anaconda 230 kv line, 35.6 mi., Missoula and Granite Counties, MONTANA. Bonneville Power Admin., 827 N.E. Oregon St., Portland, Ore. Bids Mar. 7. Awarded Mar. 13. CD 3/12, under LB.

† N. G. Petry Constr. Co., 1114 W 7 Ave., Denver, Colo., CA $841,150, officers Quarters of Lowry Air Force Base, Inv. 52-44, DENVER, COLO. U. S. Eng., 1709 Jackson St., Omaha, Nebr. Bids Feb. 19. CD 3/3, under LB.

BUILDINGS

LOW BIDS AND CONTRACTS

▲† Winston Bros. Co., N.W. Bank Bldg., and C. F. Haglin & Sons, 123 Bryant Ave. N., Minneapolis, Minn. and Missouri Valley Constr. Co., Inc., Box 801, Leavenworth, Kans. and Sollitt Constr. Co., Inc., 301 Columbia St., South Bend, 24, Ind., LB, $6,677,000, high explosive MAGAZINES and detonator Magazines for Naval Ammunition Depot, Spec. 32940 SHUMAKER, ARK. Dpt. Navy, Dist. P. Wks., Eighth Naval Dist., U. S. Naval Station Bldg., 16, New Orleans, 12, La. Bids Mar. 5. CD 2/12.

Shelton & Son, 2009 N. 67 Ave., Omaha, Neb., LB $412,437, general const., Western Hills SCHOOL, OMAHA, NEB. Bd. Educ., 3902 Davenport St., Omaha, Neb. Bids March 11. CD 2/25.

Walter Armagost Constr. Co., 519 S. Broadway, Wichita, Kan. CA $660,508, general contract, high SCHOOL, GARDEN CITY, KAN. Bd. Educ., Garden City, Kan. Bids Mar. 6. CD 2/19.

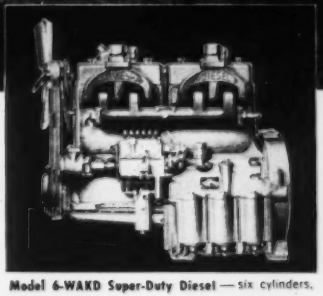
▲ E. M. Lambert & Son, Box 425, Abilene, Tex., CA, $1,155,942, Tex. 36-1, 150 DWELLING units in 49 bldgs., BORGER, TEX. Borger Housing Auth., Borger, Tex. Bids Feb. 27. Awarded About 3/11. CD 3/4.

▲ J. J. Fritch, 6834 Harry Hines Blvd., Dallas, Tex., CA, $2,988,000, Tex. 9-11-A, West Dallas HOUSING Project, 84 bldgs. for total 544 housing units, DALLAS, TEX. Dallas Housing Auth., 2525 Lucas Dr., Dallas, Tex. Bids Feb. 25. CD 3/4, under LB.

down on the levee...

moving 225,000 cu. yds. of earth

casting up to 300 yds. per hr., THIS P & H DRAGLINE HAS A



Model 6-WAKD Super-Duty Diesel — six cylinders, 6¼-in. bore x 6½-in. stroke, 1197 cu. in. displacement

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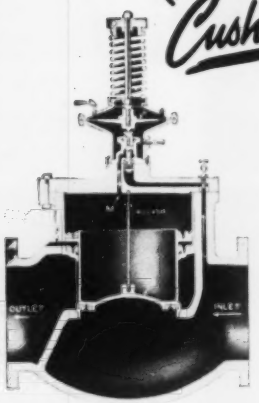
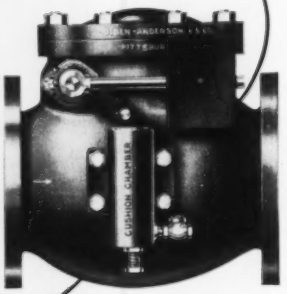
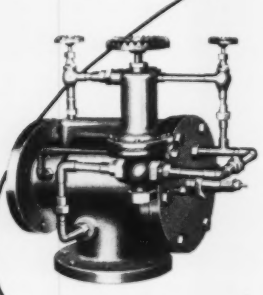


G-A ALTITUDE CONTROL VALVE



G-A SWING CHECK VALVE



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2094 KEENAN BUILDING ★ PITTSBURGH 22, PA.

Carpenter Bros., 1335 Plowman St., Dallas, Tex., LB $431,500. est. $520,000. construct Casa Via Heights SCHOOL, DALLAS, TEX., Dallas Independent School Dist., 3700 Ross St., Dallas, Tex. Bids March 10. CD 2/20.

George A. Fields, Q Avenue, Fort Worth, Tex., CA. $336,125, 50 addnl. DWELLINGS, LUBBOCK, TEX. Modern Manors Rental Homes, Inc., Lubbock, Tex. Charles E. Armstrong, First Life Bldg., Fort Worth, Tex., archt.

Clarence Moore Co., Navasota, Tex. Own Forces. Approx. $90,000. cotton WAREHOUSE, NAVASOTA, TEX. CD 11/8.

T. B. Terrell, Navasota, Tex. Own Forces. Approx. $85,000. frame, masonry cotton WAREHOUSE, NAVASOTA, TEX.

▲ Texarkana Constr. Co., 203 P & M Bldg., Texarkana, Tex., CA $1,349,000. est. $1,500,000. Cx Tex 48-1 68 low-cost HOUSING units for Negroes; Tex 48-2, 132 low-cost housing units, PARIS, TEX. Paris Housing Auth., Paris, Tex. Bids March 5. Awarded March 12. CD 3/11, under LB.

▲ Robert C. Guyler, Crystal City, Tex., LB $1,097,340. Tex. 6-11, 160 low-rental HOUSING units, SAN ANTONIO, TEX. San Antonio Housing Auth., 400 Labor St., San Antonio, Tex. Bids March 11. CD 3/11, under LB.

McLaughlin Constr. Co., Livingston, Mont. CA. $175,000. 1 story, bsmnt., rein.-con. meat packing PLANT, LIVINGSTON, MONT. Livingston Packing Co., Livingston, Mont. CD 10/3.

FAR WEST

BIDS ASKED—HEAVY CONSTRUCTION

† Idaho, Pocatello — ELECTRICAL FACILITIES — B.A. 4/2—Pub. Wks. Officer, Thirteenth Naval Dist., 1611 W. Wheeler St., Seattle, Wash., underground electrical facilities at Naval Ordnance Depot. Specs. 30398.

Ore., Coos Bay—B.A. 4/7—Ferndale Improvement Dist., Coos Bay, sewage pumping plant and 22,000 lin. ft. 8- to 24-in. sanitary sewerage sys. Stevens & Thompson, 732 S.W. 3rd St., Portland, engrs. CD 10/23/50.

▲† Calif., Santa Ana—FACILITIES—B.A. 4/8—Dpt. Navy, San Diego, Calif., additional aviation facilities, public works bldg., warehouse at Marine Air Facility Spec. 32649. Plans deposit $30.

† Oregon—B.A. 4/10—U. S. Eng., Pittock Block, Portland, one 20,700 h.p. hydraulic turbine for Dexter re-regulating reservoir, Lookout Point Dam, Civeng 35-026-52172, Lane Co.

† Oregon—B.A. 4/17—U. S. Eng., City-County Airport, Walla Walla, Wash., 358 trash rack sections and lifting beam for main and station service units, McNary Dam. Inv. 52-86.

† Wash., Tacoma—B.A. 4/27—P. Wks. Officer, Thirteenth Naval Dist., 1611 W. Wheeler St., Seattle, Wash., b. conc. paving storage areas and road along Pier 3, Naval Station, Specs. 30371.

BIDS ASKED—BUILDINGS

▲ Wash., Pasco—SCHOOL—B.A. 4/4—School Board, Pasco, 2 story, high school, $1,300,000. V. L. Wulff, Great Northwest Life Bldg., Spokane, Wash., archt. CD 12/8/49.

Calif., Norwalk—SCHOOL—B.A. 4/8—Norwalk School Dist. 12110 E. Walnut St., 1 story frame, stucco Glazier School, Approx. $300,000. Kistner, Curtis & Wright, 816 W. 5 St., Los Angeles, archts.

† Wash., Bellingham—BUILDINGS—B.A. 4/10—Pub. Wks. Officer, Thirteenth Naval Dist., 1611 W. Wheeler St., Seattle, Wash., 4 frame buildings clearing, grading 20 acres and 41,100 sq. ft. road and parking area at Lummi Island radio direction finder station Specs. 30356.

† Idaho, Boise—LAUNDRY ADDN.—B.A. 4/15—Veterans Administration, Munitions Bldg., Wash., D. C., laundry bldg., 28, addn., Proj. 11-4021, Spec. 5218.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲† Wes Meyer Constr. Co., 4220 S. 16 St., Phoenix, Ariz., CA, $673,848, 2 story, rein.-con. BARACKS, and facilities, U. S. Naval Air Facility, Litchfield Park, GOODYEAR, ARIZ. Dpt. Navy, Eleventh Naval Dist., San Diego, Calif. Bids Jan. 8. CD 1/15, under LB.

▲† M. H. Hasler Constr. Co. and D & H Constr. Co., Box 1-A, Folsom, Calif., CA, $3,173,561, levees along Columbia River and pumping plants, Kennewick, Inv. 52-57, WASHINGTON, U. S. Eng., City-County Airport, Walla Walla, Wash. Bids Feb. 21. CD 2/28, under LB.

WASHINGTON—State Hy. Dpt., Olympia, Wash.

C & E Constr. Co., Yakima, Wash., CA $64,167, stockpiling crushed materials Hy. 8, Major Creek to Lyle and Centerville Junction to Goldendale, Klickitat Co. Bids Mar. 11, awarded Mar. 11. CD 2/28.

State Constr. Co., 1245 Poplar Pl., Seattle, Wash., LB, $256,487, 55,740 ft. 8 to 18-in. sewers,

Atherton Constr. Co., Terminal Sales Bldg., Seattle, Wash., LB, $87,742, treatment plant;

R. M. Erickson, 9515 45 Ave. N.E., Seattle, Wash., 68,987 pumping plant, BRYN MAWR, WASH. Bryn-Mawr-Lakeridge Sewer Dist, Bryn Mawr, Wash. Bids Mar. 10. CD 2/26.

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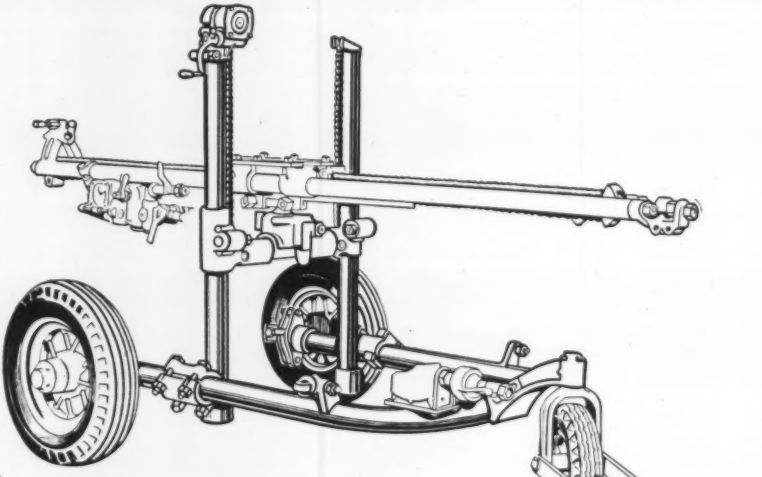

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C. A. Power, E915 Marietta St., Spokane, Wash., and **A. J. Cherf Co.,** Ephrata, Wash., CA, **$755,922,** Div. B-2 intercepting sewer project, involving 6200 ft. rock tunneling under Trent Ave. from Post to Scott St., SPOKANE, WASH. City, City Hall, Spokane, Wash. Bids Jan. 31. CD 2/5, under LB.

† **OREGON**—Bureau P. Rds., Dpt. Commerce, Morgan Bldg., Portland,
Kerman Kathman, 12054 23 N.E., Seattle, Wash., LB **$197,737.** 2.187 mi. construction, Clackamas River Rd., Clackamas Co. Bids Mar. 11.

† **Miller, Mortensen & Miller,** 200 S. Pine St., Rosenburg, Ore., CA. **$84,375,** excavation to correct potential slide condition on relocated Southern Pacific Tracks, Serial No. CIVENG 35-026-52-169, Lane Co., OREGON, U. S. Eng., Pittock Block, Portland, 5, Ore. Bids Mar. 7, awarded Mar. 7.

Pittsburgh-Des Moines Steel Co., Box 329, Santa Clara, Calif., LB **$37,130,** furnish steel for 200,000 gal. water tank, PORTLAND, ORE., Base Line Water Dist., 306 S.W. 106 St., Portland, Ore. Eldon W. Carter, Portland Trust Bldg., Portland, Ore., engr. Bids Mar. 13.

Southwest Welding & Mfg. Co., 3201 Mission Rd., Alhambra, Calif., CA, **$88,550,** construction surge tanks and fuel storage tanks for pump stations, Chino, Etiwanda-San Bernardino, Santa Fe. Springs, Los Angeles, Break, Orange CALIFORNIA. Southern California Edison Co., 601 W. 5 St., Los Angeles, Calif. Awarded Mar. 8.

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **Guy H. Hall,** 310 30 St., Bakersfield, Calif., CA, **$2,748,157,** HIGH SCHOOL, at Chester and Douglas Sts., BAKERSFIELD, CALIF. Kern County Union High School District, 1341 F St., Bakersfield, Calif. Bids Mar. 10 awarded Mar. 10. CD 2/27.

Hydro-Aire, Inc., 3000 Winona Ave., Burbank, Calif., Owner Builds, **$250,000,** 2 story, masonry PLANT, BURBANK, CALIF. R. F. Campbell, 921 Los Tunas, St., San Gabriel, Calif., engr. CD 8/9/46.

ALASKA

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲ † **Anderson-Montin-Benson,** Central Bldg., Seattle 4, Wash., LB **$1,977,000.** est. $2,600,000. 1 story 162x350 ft. rein.-con. and masonry field house, Eielson Air Force Base, Inv. 52-23, ALASKA. U. S. Eng., (APO 942, c/o PM, Seattle, Wash.). Anchorage, Alaska, Bids March 12. CD 2/27.

† **M. R. Smith,** P. O. Box 1953, Anchorage, Alaska, LB **$624,825.** est. $568,882, utility distr. sys. ANCHORAGE, ALASKA. The Alaska R. R. Dpt. Interior, Anchorage, Alaska. Bids March 12. CD 3/4.

BUILDINGS

LOW BIDS AND CONTRACTS

▲† **J. H. Pomeroy & Co. Inc.,** Joshua Green Bldg., Seattle 1, Wash., CA, **$6,472,000.** army COMMUNICATIONS STATION. Inv. 52-15, KENAI, ALASKA. U. S. Eng. (APO 942, c/o PM, Seattle, Wash.) Anchorage, Alaska. Bids Feb. 14. CD 2/25, under LB.

CANADA

BIDS ASKED—HEAVY CONSTRUCTION

Man., Portage La Prairie—MESS—B.A. 4/3—W. J. Milhausen, engr. Defence Constr. Ltd., 400 Kensington Bldg., Winnipeg, trainees mess, Scheme A, Class II R.C.A.F. Station, Approx. $500,000. Plans deposit $100.

BIDS ASKED—BUILDINGS

Que., Montreal—SCHOOL—B.A. 4/1—Marc Jarry, secy., Catholic School Comn., 117 Ste. Catherine St. W. Montreal, Que., 2 story, bsmnt., rein.-con. frame brick, stone St. Andre Apotre School Esplanade Ave., Approx. $434,000. Morin & Cing-Mars, 84 Notre Dame St. W., Montreal, Que., archts. CD 11/29.

Ont., Barriefield—HOUSING—B.A. 4/8—R. P. Opie, engr. Central Mortgage Housing Corp., 441 Queen's Quay W., Toronto, 2B, Ont., 44 housing units, at Army Camp, Job 4/51, D.N.D. Non-urban, $375,000. Plans deposit $100.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

Wm. Groves, 12 Hilda Ave., Hamilton, Ont., CA, **$75,000,** 8,460 ft. 8 in. and 3,600 ft. 6 in. water mains, small sections sewer pipe, TRAFALGAR, ONT. Trafalgar Township, Municipal Offices, Trafalgar, Ont. Bids Feb. 18, awarded Mar. 11. CD 2/11.

Georges Brassard, Lac Magantic, Que., CA, Approx. **$688,144,** earthfill dam, power house, at Grayhurst power site, LAC MAGANTIC, QUE. Town Lac Magantic, Que. CD 3/2/51.

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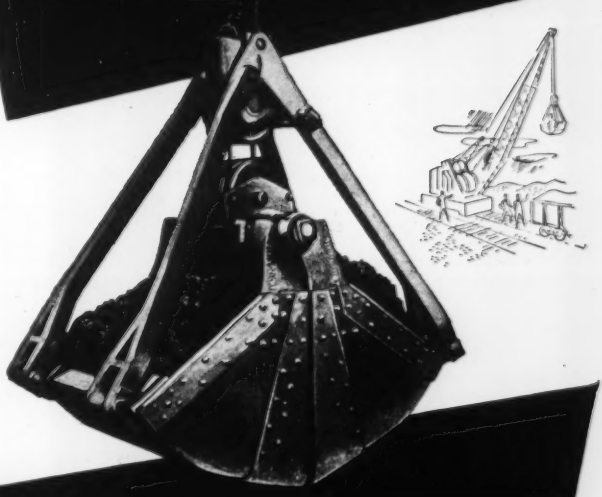

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Proposed Projects

WATER SUPPLY

Ind., Elwood—Bd. P. Wks., City Hall, WW sys. $500,000. Boyd Phelps & Assocs., 1002 Washington St., Michigan City, consult. engrs.

Minn., St. Paul Park—Village, F. S. Goth, clk., $390,000 bond election April 15, water extensions, Bettenburg, Townsend & Stolte, 1437 Marshall Ave., St. Paul, consult. engrs. CD 12/20/45.

▲ **Mont., Great Falls**—City, water distr. extensions, $2,300,000, Black & Veatch, 4706 Broadway, Kansas City, Mo., consult. engrs. CD 9/14.

N. C., Leaksville—Town, voted bonds, enlarging water sys., $453,560. Wm. C. Olsen, 5 Exchange Pl., Raleigh, consult. engr. CD 2/13.

N. C., Thomasville—Town, R. M. Cooksey, engr.; Thomasville, voted bonds Mar. 4, imprv. city water plant, $375,000.

▲† **Pa., Phila.**—Dpt. Navy, Pub. Wks. Dpt., Phila. Naval Base, water treatment facilities at Naval Shipyard. $1,175,000.

Tex., Baytown—City, bond election April 1, No. 3, WW sys. expans. $425,000; No. 4, rehabilitation existing WW sys. $100,000. CD 11/27.

Tex., Early—Town, water treatment plant, $65,000; water station pumping unit, $40,000; c.i. water distr. lines, $50,000; elevated steel water storage tank, $45,000. Marvin Turner Engineers, Nalle Bldg. Annex, Austin, consult. engrs.

Tex., Paris-City, water reservoir, $71,500; water pumping station, $40,000. Wisenbaker, Fix & Assoc., 1101½ S. Bois d'Arc St. Tuler, Tex., consult. engrs. CD 11/14.

Tex., San Saba—City, San Saba, water treatment plant, $75,000; 500,000 gal. surface water reservoir, $85,000; WW rehabilitation, $65,000. Ashley G. Classen & Assoc., 412 Martin Bldg., El Paso, consult. engrs. CD 3/13.

Tex., Teague—City, voted bonds March 8, construct earthen and concrete water retention lake on Holman Creek for domestic supply. $140,000.

Tex., Victoria—City, bond election March 28, Job. 1 water sys. rehabilitation, $545,000; Job 2, water supply, $270,000; Job 3, water distr. lines, $400,000; Job 4, water elevated storage and ground, $350,000. Lockwood & Andrews, Union Natl. Bank Bldg., Houston, consult. engrs. CD 12/28.

Vt., Rutland—City, Edward J. Crowley, city engr., City Hall, reservoir, Davis site contemplated, 7-90 m. gal. reservoir and piping. $350,000. CD 2/7/45.

Ont., Chatham—City, George Wanless, chn., City Hall, Chatham, filtration plant expansion, $500,000. T. M. S. Kingston, City Hall, city engr. CD 2/13/46.

Que., Joliette — Municipality, watermains, $330,062 voted. Chas. E. Mercier, Town Hall, town engr.

Que., Lacolle—Municipality, Lacolle, rate payers vote in favor water mains, $300,000, Lalonde & Assocs. 7370 St. Hubert St., Montreal, engrs. CD 12/12/50.

SEWERS, WASTE DISPOSAL

Ark., Stuttgart—City, Stuttgart, voted bonds, sewer imprvts. $375,000. Marion L. Crist & Assocs., Union Life Bldg., Little Rock, Ark., consult. engrs. CD 12/18.

Ark., West Memphis—City Council, sewer project, $250,000. CD 7/31/47.

Calif., Davis—City, City Hall, $225,000 bond election April 8, city drainage project, $225,000.

Calif., Millbrae—City, City Hall, $400,000 bond election April 8, sanitary sewer disposal system, etc. $100,000. CD 1/2.

Calif., Sausalito—Sausalito—Marin City Sanitation Dist., Sausalito, $775,000 bond election April 8 constr. sewer system and treatment plant, $775,000. Harry N. Jenks, 63 rescent Dr., Palo Alto, Calif., consult. engr.

Colo., Denver—City and Denver Co., City and County Bldg., construct storm sewer Dist. 372, $700,000. Terry Owens, City and County Bldg., city engr.

▲ **Del., Wilmington**—City, Street & Water Dpt., City Hall, Contract No. 7, sewage treatment plant. $3,000,000, Whitman, Requardt & Assoc., 1304 St. Paul St., Baltimore, 2, Md., engrs. CD 2/15/51.

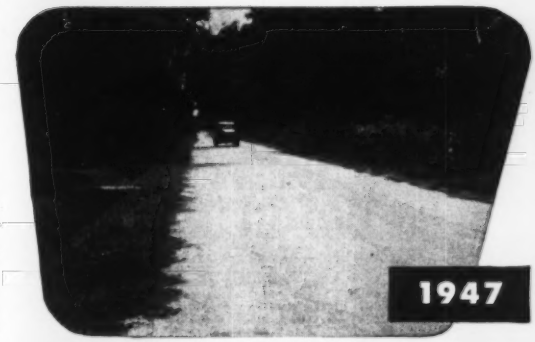
Ia., Algona—City, Byron P. Richardson, mayor, City Hall sewage disposal plant and interceptor sewers, etc. $365,000. Buell & Winter, 508 Insurance Exchange, Sioux City, Ia., consult. engrs. CD 12/31.

▲ **Ky., Louisville**—Metropolitan Sewer Dist., 414 W. Jefferson St., sewer sys. to serve General Electric plant at Buechel, $3,650,000, L. S. Vance, engr. CD 5/28/51.

Mass., Bedford—Town, Sewer Comn., Town Hall, sewerage sys. to connect at North Lexington with trunk line near Rte. 128, $275,000. CD 9/1/50.

Mass., Newton—City, City Hall, Newton Center, outfall sewers, $250,000.

Minn., Brooklyn Center (Minneapolis P. O.)—Village, P. H. Weekly, clk., 1212 55 Ave. N., Minneapolis, storm and sanitary sewers, $211,000.



Chester Levee Road, built in 1947

Steam Mill Ferry Road, built in 1949

Christmasville Road, built in 1950

Old Medina Road, built in 1951

Soil-Cement is solving the need for economical, all-weather roads in Madison Co., Tenn.

A few years ago the officials of Madison County, in western Tennessee, re-appraised their road program. They were spending an average of $100,000 annually for maintenance. The challenge was to reduce this expense while upgrading the road system.

After investigating the problem county officials decided that the practical solution was soil-cement pavement.* Their new program began with the building of 15.5 miles of soil-cement pavement in 1947.

The first soil-cement roads performed so well that beginning in 1949 additional soil-cement roads were built each year. Today the county has more than 50 miles of durable, all-weather soil-cement paving. Another 15 miles is planned for 1952.

Thus soil-cement is solving the need for economical all-weather roads. There have been no base failures and there is no evidence of any depreciation in existing bases. Yet in below-zero temperatures other types of pavement have been damaged.

Like Madison County, other counties, as well as cities and states all over America have found that soil-cement is ideal all-weather pavement for low-cost roads, streets and airports. It is very economical because most of the material required is soil already on the site. Construction procedures are fast and simple too. And maintenance cost is low, as proved by records on constantly increasing mileage.

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*Consists of a soil-cement base and bituminous surface.

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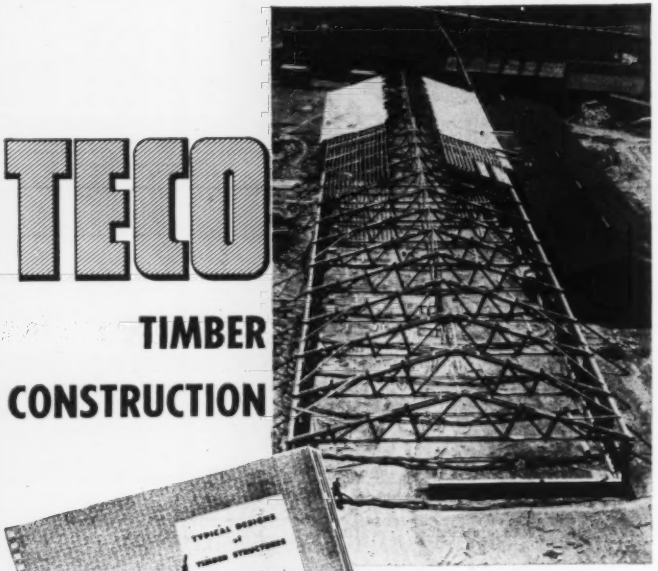

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ENR

Minn., St. Paul Park—Village, F. S. Goth, clk., $410,000 bond election April 15, sewer extensions, Bettenburg, Townsend & Stolte, 1437 Marshall Ave., St. Paul, consult. engrs. CD 3/13/46.
Mo., Lexington—City, voted $380,000 bonds Mar. 5, sewerage sys. imprvs.
Mo., Nevada—City, sewage disposal plant or plants and sewer extens., imprvs. $500,000. CD 1/6/47.
Tenn., Springfield—City, sewage disposal plant, $200,000. CD 3/26/51.
N. C., Leaksville—Town, voted bonds, sewer imprvs. $396,440. Wm. C. Olsen, 5 Exchange Pl., Raleigh, consult. engr. CD 2/13.
▲ **O., Cleveland**—City, City Hall, Lakeside and 6 Sts., Southerly Sewage Disposal Plant addns. and imprvs., E. 71 St. and Independence Rd. $2,066,000. CD 11/14/50.
Tex., Baytown—City, bond election April 1, No. 1, sewage disposal plant, $140,000; No. 2, sanitary sewer collection lines extens. and imprvs. to sys. $340,000. CD 11/27.
Tex., Paris—City, sewage lift station sys. $255,000; 2nd unit of sewer line to Army Camp, $60,000; addnl. sanitary sewer collection lines, $75,000. Wisenbaker, Fix & Assoc., 110½ S. Bois d'Arc St., Tyler, Tex. consult. engrs. CD 11/14.
▲ **Ont., Sarnia**—Council, Mayor W. C. Nelson, sewer extension to industrial areas and revamping present system, $1,500,000 to $2,000,000. William Greenwood, City Hall, Sarnia, engr. CD 6/22/49.

BRIDGES

▲ **Tenn., Memphis**—City, City Hall and Shelby Co. Court House, replacing Airways Bridge. $3,000,000. Wm. Fowler, city engr.
Quebec—Dpt. P. Wks., Quebec City, Que. (Prov. Govt.) bridge Highway No. 18 at Terrebonne Village, $100,000. O. Desjardium, c/o owner, engr.

STREETS AND ROADS

Del., Wilmington—City, City Hall, paving Orange St. front to 19 Sts. $100,000. Edwin Koester, city engr.
Fla., St. Petersburg—City, City Hall, paving from Tampa Bay to 35 St., Approx. $150,000.
GEORGIA—State Hy. Dpt., Atlanta.
Muscogee Co.—wid'n. Warm Springs Rd. from Hilton Ave. in city of Columbus to Muscogee Co. line, Approx. $100,000.
Ga., Augusta—City, City Hall, 4-lane highway from Fifth and Calhoun Sts. southward. Approx. $100,000.
Ga., Savannah—City, City Hall, Savannah, paving Habersham St. $300,000. CD 2/11/49.
Mich., Bay City—City, Dpt. P. Wks., black topping various streets, $155,000; maintenance work program, $140,000; c. conc. various streets, $188,000. R. G. McGillivray, City Hall, engr.
Neb., Omaha—Douglas Co., Court House, pave from McKinley St. to (State Hy. 36, 72nd St.) for approach to New North Omaha Bridge, near here. $230,000. Wm. Green, county engr. CD 2/21.
▲ **N. C., Fayetteville**—City, City Hall, voted bonds, streets. $1,000,000. CD 2/13.
O., Cleveland—City, City Hall, Lakeside and 6 Sts., resurf. 5.5 mi. St. Clair Ave., Ontario to E. 105 St.; b. conc. 3 mi. Detroit Ave., W. 65 to Western Sts. $590,000. CD 9/18/44.

EARTHWORK, WATERWAYS

▲ **Calif., Sacramento**—Dpt. P. Wks., P. Wks. Bldg., Sacramento, survey and exploration work for Feather River Project, $1,270,387,000. A. D. Edmonston, P. Wks. Bldg., Sacramento, State engr.
Tex., Paris—Texas Power & Light Co., Interurban Bldg., Dallas, construct earthen lake of 6,000 acre ft. with pumping plant to pump flood water from Sulphur River to fill lake. 30 mi. southeast of here. $375,000.

AIRPORTS

Kan., Topeka—ADMINISTRATION BLDG.—Topeka Aviation Comn., 3600 Sardou St., plans by Thos. Williamson, Victor Loebsack & Assoc., National Bank of Topeka Bldg., administration bldg. at municipal airport, $125,000. CD 4/13/50.
▲† **Md., Baltimore**—FACILITIES—U. S. Eng., 24 St. and Maryland Ave., plans by Lawrie & Green, 321 N. Front St., Harrisburg, Pa., air research and development command headquarters facilities, incl. barracks, office, library, mess hall, parking, water, sewer and site imprvs., $4,846,000.
▲ **Mich., Detroit**—AIRPORT—Detroit Aviation Comn., 11201 Conner St., city airport on 1,400 acres, suburb on location Oakland-Macomb city line, John R. Ryan and 13 Mile Rds. $15,000,000.
▲† **Minn., Duluth**—HOUSING—U. S. Eng., 1709 Jackson St., Omaha 2, Neb., housing and quarters facilities, Duluth Air Force Base, $1,000,000. CD 11/12.
Neb., McCook—AIRPORT—City, City Hall, airport imprvs. $100,000. CD 1/8/45.
▲ **O., Cleveland**—ADMINISTRATION BLDG.—City, City Hall, Lakeside and 6 Sts., plans by Outcalt, Guenther & Assoc., 13124 Shaker Square, Cleveland, airport admin. at Cleveland Airport. $6,253,000. CD 2/15/51.

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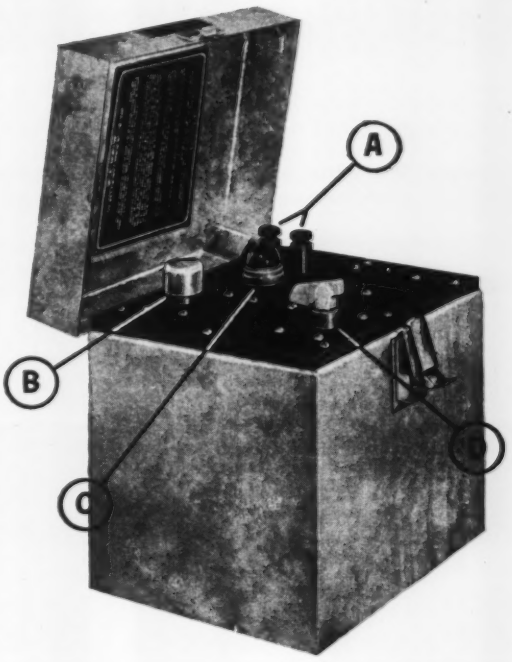

This latest product of Du Pont Explosives Research is a newly designed, portable, condenser discharge type blasting machine. In two models: CD-45 and CD-30.

Both machines have exceptionally high capacity. The larger (CD-45) is the most powerful built to date. Both machines easily fire small tunnel rounds in straight parallel . . . sizable rounds in straight series . . . and a surprisingly large number of caps in parallel series.

These new machines have been thoroughly tested in various kinds of operations throughout the country and have been found suitable for every conceivable type of blasting job, either on the surface or underground. The number of caps fired is not dependent on the physical effort applied by the operator, and the machines contain no moving parts.

Several built-in safety features provide maximum protection at all times. A group of long-lasting, radio-type B batteries are used to charge a number of condensers. At the moment of firing, these condensers deliver a powerful, instantaneous surge of power to the blasting circuit. The terminals are dead at all times except at the instant of firing and can never be made alive unless the operator has both hands on the controls and really means to fire the shot.

THEY'RE SIMPLE TO USE:

1. Connect wires to terminal posts "A" shown in photo above.
2. Depress charging switch "B" and hold until neon pilot light "C" shines brightly.
3. Still holding charging switch down . . . move firing switch "D" to "on" position. This action fires the charge. *Terminals are energized only at the moment of firing* . . . absolutely removing risk of a premature blast. It's as simple as that!

SPECIFICATIONS

The new Du Pont blasting machine is available in two compact models encased in rugged, waterproof, electroplated metal boxes:

MODELS	CAPACITY straight series			
	primary blast	secondary blast	straight parallel	parallel series
CD-30 (small) wt. 24½ lbs. length 9½ inches width 9½ inches height 10½ inches	50	125	25	480 (12 series of 40 each)
CD-45 (large) wt. 31 lbs. length 11 inches width 9½ inches height 11½ inches	50	200	50	1200 (30 series of 40 each)

ASK THE Du Pont Explosives representative in your area for complete information about this new, safer, more dependable, high-capacity blasting machine. E. I. du Pont de Nemours & Co. (Inc.), Explosives Department, Wilmington 98, Delaware.

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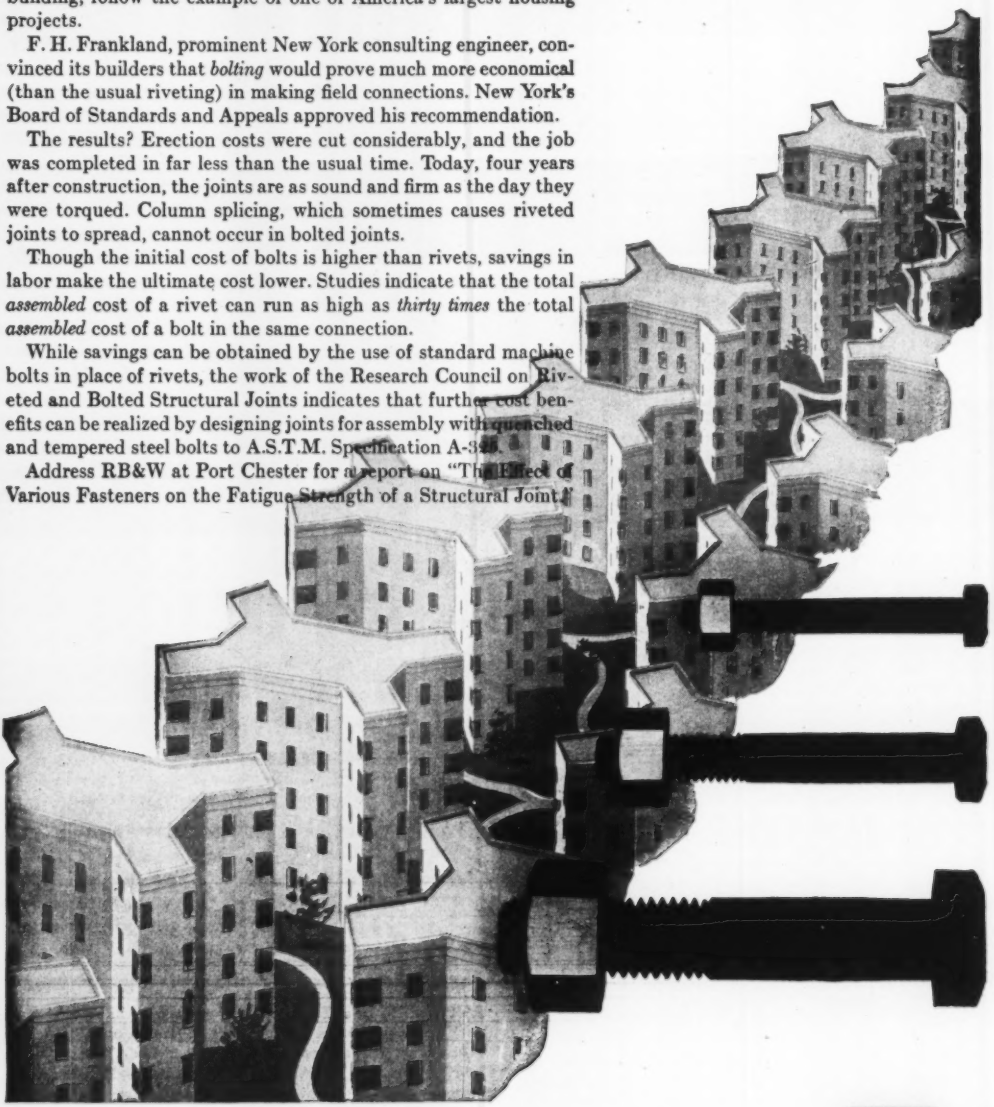

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PUBLIC BUILDINGS

▲ **Ala., Birmingham**—HOSPITAL—City, City Hall and Jefferson Co., Court House, Birmingham, Ensley Negro Hospital, $1,000,000.

Calif., Pomona—EXHIBIT—Los Angeles County Fair Assoc., Pomona, plans by Gable & Wyant, 14906 Ventura Blvd., Los Angeles, frame floral exhibit bldg. $200,000. Harold P. Ring, 14906 Ventura Blvd., Los Angeles, consult. engr.

Calif., San Diego—SCHOOL—San Diego Unified School Dist., 825 Union St., plans by Earl F. Giberson, 426 B St., San Diego, Calif., 1 story, frame, stucco Valencia Park Elementary School, $300,000. CD 11/16/50.

Calif., San Rafael—COURT HOUSE WING—Marin Co., Court House, San Rafael, plans by Bliss, Trudell & Berger, 883 Mission St., San Francisco, wing of court house, $300,000. CD 2/1.

Calif., Santa Clara—SCHOOL ADDNS.—Santa Clara City Elementary School Dist., 1553 Bird Ave., San Jose, voted $890,000 bonds, school addns. CD 2/19.

Calif., Sebastopol—SCHOOL ADDNS.—Analy Union High School District, 736 Eastside Ave., Sebastopol voted $990,000 bonds, school addns., imprvts. J. Clarence Felciano, 4010 Montecito Ave., Santa Rosa, archt. CD 1/28.

Colo., Pueblo—FIRE STATION—City, John O. Hall, mgr., City Hall, fire station, Richmond and Main Sts. $325,000. CD 11/16.

Conn., Manchester—SCHOOL—Town, plans by Ebbets Frid & Prentice, 862 Asylum Ave., Hartford, School Vernon and Lyndall Sts., $550,000. CD 7/9.

▲ **Conn., Norwich**—PATIENTS BLDB.—State P. Wks. Comrs., State Office Bldg., Hartford, plans by Walter Crabtree Jr., 195 Fern St., West Hartford, 3 story, bsmnt., brick, steel, concrete patients bldg., Norwich State Hospital, $2,500,000.

Fla., Fort Lauderdale—SCHOOL—Broward Co. Bd. P. Instruction, Fort Lauderdale, plans by Courtney, Stewart 1140 Bayview Dr., Coral Ridge, Ft. Lauderdale, high school, Pompano Beach $500,000. CD 3/10/50.

Fla., Miami—PRISON STOCKADE—City, City Hall, prison stockade, $430,000.

Ga., Athens—SCHOOL—City Bd. Educ., Athens, Industrial high school, $350,000.

▲ **Ga., Macon**—HOSPITAL—City, voted bonds Macon Hospital addns. $2,500,000. CD 1/29.

Fla., St. Augustine—JAIL—St. Johns County Comrs., St. Augustine, jail, $350,000.

† **Ga., Macon**—PAINT SHOP, etc.—Dist. P. Wks. Office, Box 365, Naval Base, S. C., plans by N. J. Pascullis, 609 Bankers Insurance Bldg., Macon, Ga., paint shop-storage bldg. at Naval Ordnance Plant, Approx. $100,000.

Idaho, Sandpoint—SCHOOL—School Board, Sandpoint voted bonds, high school, $400,000. CD 2/6.

Ind., Boonville—SCHOOL—Bd. School Trustees, E. E. Glenn, supt. of Schools, Boonville plans by Ralph Legeman, 10 Chestnut St., Evansville, Ind., 2 story, brick, rein.-con., school bldg., $300,000.

▲ **Ind., Hammond**—SCHOOL—School City of Hammond, 5935 Hohman St., plans by L. Cosby Bernard & Co., 7241 Forest St., Technical and Vocational High School, $2,000,000. Leo Besozzi, 5217 Hohman St., consult. engr. CD 9/8/48.

Ind., Indianapolis—WAREHOUSE, etc.—State Fair Board State Fair Grounds, E. 38 St., Indianapolis, 3, Ind., plans by Burns & Burns, 824 Architects and Builders Bldg., Indianapolis, Zone 4, 2 story, bsmnt. 60x100 ft., brick, rein.-con. warehouse, utility and office bldg., $200,000.

Mass., Acton—SCHOOL—Town, School Dpt., elementary school, $450,000.

▲ **Minn., Fairbault**—SCHOOL—Bd. Educ., Independent School Dist. No. 1, R. W. Klemer, clk., $1,300,000 bond election Mar. 20, high school, grade school, addns to 2 grade schools, etc., Magney, Tusler & Setter, 202 Foshay Tower, Minneapolis, archts. CD 11/14.

Miss., Brookhaven—PLANT—City, voted $600,000 bonds, mfg. plant for Johnston Lawn Mower Corp. CD 2/13.

Miss., Calhoun City—PLANT—Town, addns. to plant leased by Calhoun Garment Co., $100,000. CD 7/19/45.

Miss., Cleveland—INFIRMARY-EDUCATIONAL BLDG.—State, Bldg. Comm., Woolfork Bldg., Jackson, infirmary-educational bldg., Delta State Teachers College, $900,000.

▲ **Miss., Holly Springs**—PLANT—Marshall County, c/o county clk., $1,200,000 bond election Mar. 28, mfg. plant. CD 2/14.

▲ **Neb., Hastings**—SCHOOL—Bd. Educ., Hastings, bond election Apr. 1, Senior High School. $1,570,000. CD 5/28.

▲ **N. Y., Brooklyn**—HOUSING—New York City Housing Auth., 63 Park Row, New York, Zone 38, Marlboro Houses, 1,800 families on 35 acre site bounded by Avenue V, 86 St., W. 8 St., Avenue X, W. 11 St., Avenue W and Stillwell Ave. $27,000,000.

▲† **N. Y., Camp Shanks**—WAREHOUSE—U. S. Eng., 80 Lafayette St., New York, Zone 13, plans by Binger, Prince & Ashley, 27 William St., New York, Zone 5, warehouse rehabilitation. $500,000-$1,000,000.

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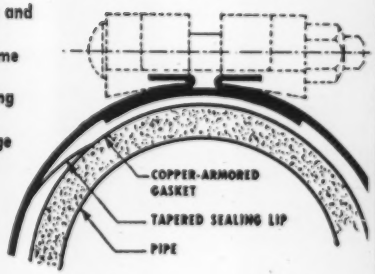

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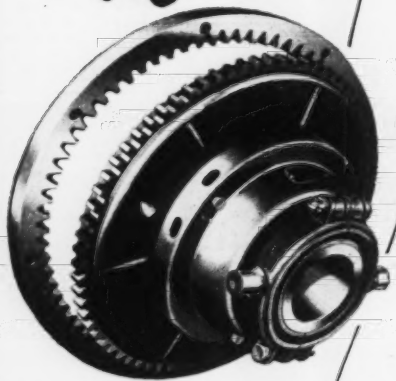

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▲ **N. Y., New York**—HOUSING—New York City Housing Auth., 63 Park Row, Zone 38, Frederick Douglass Houses, 2,000 families on 22½ acre site bounded by W. 100 St., Amsterdam Ave., 104 St. and Manhattan Ave. $30,000,000.

▲ **N. Y., White Plains**—HOUSING—White Plains Housing Auth., 223 Grove St., 200 family housing project on 5-acre site on Lake St. $3,300,000. CD 7/9/47.

▲ **N. C., Fayetteville**—SCHOOLS—Bd. Comrs. Cumberland Co., R. E. Nimocks, clk., Fayetteville, bond election May 31, schools. $3,500,000.

N. C., Gastonia—HIGH SCHOOL—Gaston Co. Bd. Educ., Gastonia, Negro High School. Approx. $500,000.

▲ **O., Springfield**—SCHOOLS—Bd. Educ., 49 E. College Ave., Grayhill School, W. Jefferson St. and Montgomery Aves. $300,000; Snyder Park Junior High School, W. High St. and Dayton Ave., $1,000,000. CD 11/14/45.

† **O., Toledo**—ARMORY—U. S. Eng., 237 Fourth Ave., Huntington, W. Va., plans by Peterson, Huffman & Grow, Spitzer Bldg., armory. $285,000. CD 11/7.

▲ **O., Van Wert**—HOSPITAL—Van Wert County Hospital Assoc., c/o County Comrs., Court House, $1,400,000 bond election November 4, hospital on 4-acre tract south of city, adjacent to Willow Bend Country Club. $2,100,000.

Okla., Ada—HIGH SCHOOL—Bd. Educ., Ada, plans by A. S. Ross, Ada, junior high school. $350,000.

Okla., Idabel—HOSPITAL—McCurtain County, Idabel, voted bonds, county hospital. $300,000. Harold Flood, Ardmore, archt. CD 12/20.

Pa., Eau Claire—SCHOOL—Joint School Dist., Concord, Venang and Washington Twps., Eau Claire Boro, Eau Claire, plans by B. J. McCandless, 239 4th St., Ellwood City, 1 story brick, block consolidated grade school, high school addn. $500,000. CD 12/18/50.

Pa., Evans City—SCHOOL—Joint School Districts of Evans City, Forward Twp. and Jackson Twp., Evans City, plans by B. J. McCandless, 239 4th St., Ellwood City, 1 story bsmnt., 64x284 ft. brick consolidated grade school. $350,000.

▲ **Pa., Oxford**—HIGH SCHOOL—Oxford Area Joint School Bd., Oxford, plans by Buchart Engineering Co., engr. and archt., 611 W. Market St., York, high school, elementary school and altering present high school. $2,500,000. CD 7/18.

† **Pa., Phila.**—POWER PLANT—Dpt. Navy, Pub. Wks. Dpt., Phila. Naval Base, power plant imprvs. at Naval Shipyard. $925,000.

S. C., North Charleston—HIGH SCHOOL—Cooper River District School Bd., c/o Halsey & Cummings, archts., 4 Broad St., Charleston, Negro High School. $608,000.

▲ **Tenn., Memphis**—RIVER TERMINAL BLDG.—Memphis and Shelby County Port Comm., Memphis, river terminal bldgs., transit sheds, paving, erection railroad tracks on President Island. $12,000,000. Wm. Fowler, city engr.

▲ **Tenn., Murfreesboro**—DORMITORY—State Bd. Educ., War Memorial Bldg., Nashville, women's dormitory at Middle Tennessee State College. $1,500,000.

Tex., Amarillo—LIBRARY—City, City Hall, plans by Malcolm O. Carder, Fisk Bldg., public library, 10 and Polk Sts. $350,000.

▲ **Tex., Amarillo**—SCHOOLS—Amarillo Independent School Dist., Avondale School addn., $300,000; Senior High School, $650,000; Junior High School, $750,000; No. 1 Elementary School, $450,000; No. 2, Elementary School, $375,000; No. 3 Elementary School, $425,000; vocational shops, $300,000; grade school, $350,000; general school remodeling, $1,000,000. CD 11/15.

Tex., Highland Park—SCHOOL—Highland Park Independent School Dist., 3610 Cornell St., replacing Armstrong Elementary School. $712,000.

Tex., Mission—SCHOOL—Mission Independent School Dist., Mission, voted $200,000 bond election March 8, elementary school and addn. $300,000.

Tex., Nacogdoches—SCHOOLS—Nacogdoches Independent School Dist., c/o B. A. Copass, Supt. Schools, Nacogoches, voted bonds, two 1-story elementary schools; 1 story Negro High School, brick, tile, concrete constr. $850,000. H. B. Tucker, Nacogdoches, assoc. archts., and P. M. Geren, N. P. Anderson Bldg., Fort Worth, arcnt. CD 9/21.

Tex., San Antonio—SCHOOL—Alamo Heights Independent School Dist., 150 E. Fair Oaks, Alamo Heights, San Antonio, bond election Apr. 5, 44,000 sq. ft. school, $545,000.

Tex., Sequin—SCHOOL—Sequin Independent School Dist., Sequin, voted bonds elementary school for negroes, $330,000; grade school, $305,000; Juan and High School addns., repairing, renovating, $300,000; new elementary school, $315,000. Julian & White, 2901 Transit Tower, San Antonio, archts. CD 2/20.

Va., Woodstock—SCHOOLS—Shenandoah Co. School Bd., Woodstock, plans by J. R. Mims, 2420 Wilson Blvd., Arlington, Mt. Jackson High School; Tom Brook High School both over $350,000.

Vt., Winooski—HIGH SCHOOL—Town, Robert D. Lull, Jr. Supt. Schools, Shelburne, high school. Approx. $500,000.

Wash., Kent—SCHOOL ADDN.—School District 415 Kent, Kent-Meridian Senior High School addn., $350,000.

Wash., Port Orchard—SCHOOLS—South Kitsap School District 402, Port Orchard, plans by Mallis & De Hart, Lyon Bldg., Seattle, Zone 4, schools in Bethel and Manchester-Harper areas, $300,000 each. CD 2/6.

Wis., Appleton—SCHOOL—Bd. Educ., 120 El Harris St., plans by Geo. Narovec, 606 W. Wisconsin St., 1 story irregular 330x60x88 ft., Richmond Grade School, $325,000. CD 9/12.

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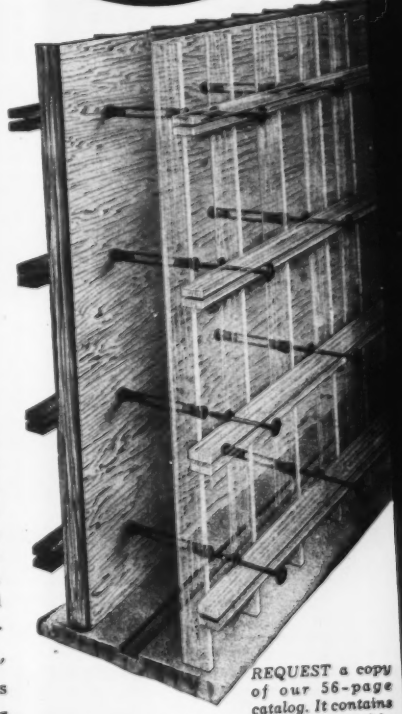

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Ark., Little Rock—RESIDENTIAL DEVELOPMENTS—W. R. Davis, Little Rock, residential developments, $300,000.

Ark., Little Rock—RESIDENTIAL DEVELOPMENTS—Robert Moyer, Little Rock, residential developments, $300,000.

Ark., Little Rock—RESIDENTIAL SUBDIVISION—Walthour Flake Co., 402 Louisiana Ave., Kingswood Place residential subdivision, Approx. $300,000.

Ark., Paris—EDUCATIONAL BLDG.—First Baptist Church Paris, auditorium and 3 story educational bldg., $300,000.

Conn., West Hartford—RESIDENCES—Elm Realty Inc., c/o E. H. Schuder, 52 Dartmouth Ave., 48 residences 17-acre tract, South Quaker Lane.

▲ Ill., Chicago—SHOPPING CENTER—Chicago Suburban Centers, Inc., c/o Marshall Field & Co., 25 E. Washington St., plans by Perkins & Will, 309 W. Jackson Blvd., Zone 6, shopping center named "Old Orchard" on 110 acres. $12,000,000.

▲ Ill., Chicago—HOSPITAL—Michael Reese Hospital, 29 and Ellis Ave., plans by Loebl, Schlossman & Bennett, 430 N. Michigan Ave., Zone 11, two addns. to hospital, $3,585,000. CD 1/26/51.

Ind., Columbus—HOUSING—Dunlap Development Co., E. Jackson St., 2 story, brick, stone, 22 dwelling unit housing. $200,000.

La., Alexandria—DEPARTMENT STORE—Haas Investment Co., c/o Charles T. Robert, archt., Guaranty Bank Bldg., department store, $500,000.

La., New Orleans—CHURCH—Carrollton Avenue 2430 S. Carrollton Ave., plans by Favrot, Reed, Mathes & Bergman, 402 Nola Bldg., church. $325,000.

Md., Aberdeen—APARTMENTS—Oakwood Apartments, 6980 Maple Ave. N.W., Wash., D. C., plans by Ronald Senseman, 327 Carroll St. N.W., Wash., D. C., sixty 2 story, brick, cinder block garden type apartments, $425,000.

Md., Brooklyn (Baltimore) — HOUSES — Wood Brook Homes, Inc., c/o L. A. Menefee, archt., 347 N. Charles St., Baltimore, one hundred and ten 2 story, brick, cinder block row type houses, $660,000.

Md., Frederick—APARTMENTS—Stewart Manor, Inc., 6980 Maple Ave. N.W., Wash., D. C., plans by Ronald Senseman, 327 Carroll St. N.W., Takoma Park, Wash., D. C., 2 story, brick, cinder block apartments, near Camp Detrick, $350,000.

Mass., Everett—SCHOOL, etc.—Saint Theresa of the Little Flower Parish, T. P. Linehan 20 Gledhill Ave., school, convent and auditorium, $500,000. CD 11/22/44.

Mass., Worcester — HOSPITAL — Doctors Hospital of Worcester, Inc., 107 Lincoln St., plans by Irving Salsberg & Ralph LeBlanc, 1411 Commonwealth Ave., Brighton, 4 story, brick, steel hospital addn.

Mich., Berrien Springs—CHURCH—Seventh Day Adventist Parish, S. E. Wright, comr., Berrien Springs, plans by Kenneth W. Williams, Kokomo, Ind., 1 story, bsmnt., brick, stone church, Emanuel College campus. $425,000.

Mich., Lansing—CHURCH—Christ Lutheran Church, 116 S. Pennsylvania St., plans by Earl L. Confer, 14000 Strathmore St., Detroit, 2 story, brick, stone church addns., incl. educational unit, church tower and parsonage. $300,000.

Mich., Wayne—CHURCH—First Methodist Church, Wayne, plans by Earl L. Confer, 1400 Strathmore St., Detroit, 1 story, bsmnt., brick, stone church. $350,000.

Miss., Tupelo—ORPHANAGE—Tupelo Children's Mansion, Tupelo, plans by Frank Kincannon, Tupelo, orphanage, $300,000.

Miss., West Point—CHURCH—First Presbyterian Church, West Point, church, $300,000.

▲ Mo., St. Louis—HOSPITAL—John Cardinal Glennon Memorial Hospital, c/o Archbishop Joseph E. Ritter, Catholic Archdiocese of St. Louis, 3810 Lindell Blvd., Zone 8, plans by Maguole & Quick, 4903 Delmar Blvd., Zone 8, 6 story, bsmnt., 1,700,000 cu. ft. X-shaped hospital, $3,750,000. CD 9/26/50.

▲ Neb., Lincoln—ADMINISTRATION, etc.—Union College, V. S. Dunn, Bus. Mgr., 3800 S. 48 St., administration bldg. $500,000; power plant for college. $800,000.

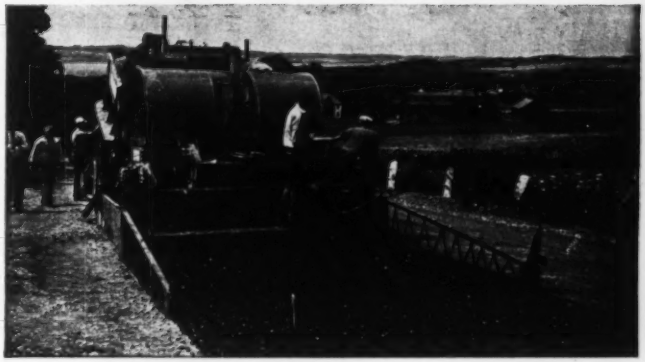
▲† N. J., Belle Meade—HOUSING—U. S. Eng., 80 Lafayette St., New York, 13, N. Y., construct, manage and finance housing, $500,000-$1,000,000. Dowling & Kupper, 15 Steelton Road, New Market, N. J., archts.

N. Y., Kew Gardens—SCHOOL—Queen of Peace Roman Catholic Church, c/o Joseph Mathieu, archt., 32 Court St., Brooklyn, Zone 2, 2 story 61x107 ft. parochial school, 77 Rd. and Main St. $350,000.

N. C., Franklin—CHURCH—Franklin Baptist Church, Franklin, plans by J. H. Wallace, 927 James Bldg., Chattanooga, Tenn., church. $350,000.

O., Dayton—HOME FOR AGED—Lutheran Inner Mission, Rev. F. R. Stoneburner, 201 Commercial St., 117x225 ft. T-shaped Home for Aged (First unit), of Bethany Lutheran Village on Lebanon Pike. $350,000.

▲ Pa., Homestead—CHURCH, etc.—St. Teresa's Roman Catholic Church, 3609 Superior St., plans by Wm. Richard Perry, 2882 W. Liberty Ave., Pittsburgh, Zone 16, church, school, convent. $1,500,000.



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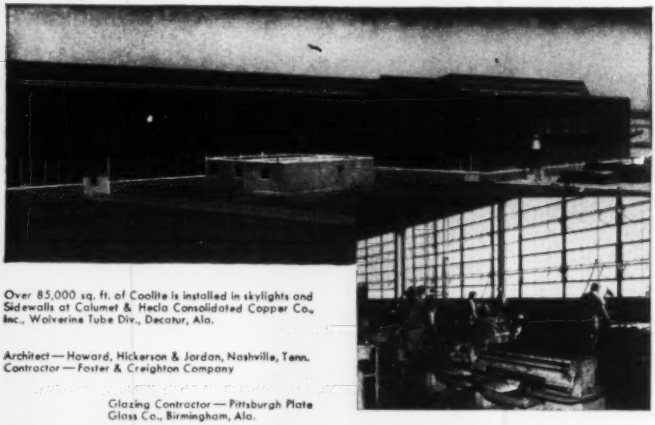

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Tex., Austin—CHURCH, RECTORY—St. Austin's Church Congregation, 403 W. 21 St., plans by Walter Cocke, Jr., 1507 Franklin St., Waco, 3 story 120x140 ft. part concrete and steel frame, stone exterior and interior church and rectory. $450,000. Frank T. Drought, 117 W. Pecan St., San Antonio, consult. engr. CD 1211/46.

Tex., Beaumont—MERCANTILE BLDG.—Kaufman Trust Co., c/o A. M. Kaufman, American Natl. Bank Bldg., reconstruct mercantile bldg. $450,000.

Tex., Conroe—HOTEL—Hotel Syndicate, c/o City Council, Conroe, 60-room masonry type hotel. $475,000.

Tex., Fort Worth—TELEPHONE BLDG.—Southwestern Bell Telephone Co., 1115 Throckmorton St., telephone bldg. $350,000.

Tex., Houston—DWELLINGS—J. A. Kelley, 3709 Garnet St., eight 1 and 2 story brick, stone dwellings, various locations. $320,000.

Tex., Houston—DWELLINGS—Fred McManus, 20 Sunset Blvd., masonry dwellings, on portions Ella Lee, Chevy Chase Sts. $345,000.

▲ Utah, Huntsville—MONASTERY—Abbey of Our Lady of the Holy Trinity, Rt. Rev. Mauritius M. Lans, Abbot, c/o Ashton, Evans & Brazier, archts., 26 W. S. Temple St., Salt Lake City, construct Cistercian Monastery near here. $12,000,000.

Utah, Ogden—STAKE HOUSE—Latter Day Saints Church, 47 E. S. Temple St., Salt Lake City, plans by Fred L. Markham, 45 N. University Ave., Provo, stake house. $500,000. CD 5/4/49.

▲ Vt., Rutland—HOSPITAL—Rutland Hospital, J. R. McLaughlin, chn. of Publicity, c/o Tampax Inc., Columbian Ave., 3 story 150-bed hospital. $2,000,000. CD 5/10/46.

Va., Arlington—CHURCH—St. Georges Episcopal Church, Arlington, church. $350,000.

Va., Norfolk—STORE—Home Furniture Co., 614 Church St., plans by Alfred M. Lublin, 731 W. 21 St., furniture store addns. Approx. $300,000.

Wis., Madison—Y.M.C.A.—University of Wisconsin, 740 Langdon St., plans by Weiler & Strang, 114 N. Carroll St., 5 story, part bsmnt., 145x150 ft., Y.M.C.A. bldg. $628,336. CD 5/21/51.

Wis., Menasha—CHURCH—Trinity Lutheran Congregation, 335 Broad St., plans by E. A. Stubenrauch, 710 Erie Ave., Sheboygan, 1 story, bsmnt., 42x150 ft., church and parochial school. $300,000.

Wis., Waterford—CHURCH—Norway-Muskego Congregation, Waterford, Wis., plans by E. A. Stubenrauch, 712 Erie Ave., Sheboygan, church. $300,000.

INDUSTRIAL BUILDINGS

Ark., Lonoke—PLANT—Lonoke Grain Drying Co., Lonoke, Ark., enlarging grain drying plant, $150,000.

Ark., Ozark—SUBSTATION—Arkansas Valley Electric Co-operative Ozark, erecting substation, $750,000.

▲ Fla., Foley—PLANT—Buckeye Cellulose Corp., c/o Procter & Gamble Co., 155 E. 44 St., New York, N. Y. pulp plant, $20,000,000.

Fla., Miami—PLANT—Kensington Realty Co., c/o Riley Ross, engrs., 3047 Biscayne Blvd., Miami, Fla. mfg. plant. Approx. $100,000.

Ill., Bloomington—FACTORY ADDN.—Eureka-Williams Corp., Bloomington, 50,000 sq. ft. factory addn., $300,000. Bruce A. Gordon, 1 N. La Salle St., Chicago 2, Ill., consult. engr.

Ill., Kankakee—FACTORY—A. O. Smith Corp., 3533 N. 27 St., Milwaukee, Wis., factory addn. $600,000.

Ind., Elkhart—FEED MILL—Elkhart County Farm Bureau Co-operative Assn., Inc., De Main Warner, pres., Elkhart, Ind., brick, rein.-con. feed mill, $300,000.

▲ Kan., McPherson—COKING UNIT—National Co-operative Refinery Assn., McPherson, coking unit. $2,000,000.

Md., Baltimore—SHOPS—Baltimore Transit Co., 1515 Washington Blvd., maintenance shops addns., $220,000.

Md., Baltimore—PLANT AND OFFICE—Maryland Clothing Manufacturers, 521 E. Preston St., plans by J. E. Moxley, 1722 Ellamont St. 1 story, steel, brick, cinder block 35,000 sq. ft. plant and office, $350,005.

Mass., Dighton—PLANT—Arnold Hoffman Co., Inc., c/o Jenks & Ballou, engrs., 2600 Industrial Trust Bldg., Providence, R. I., plant addn., $100,000.

Mass., Harvard—LABORATORY—Weston Laboratories, 410 Glen Rd., Weston, plans by Barton & Kline, 67 Mt. Vernon St., Cambridge, electronics laboratory, $100,000, 1 story, 20,000 sq. ft. non-combustible laboratory, $82,000. CD 2/4.

Mass., Springfield—WAREHOUSE—Monsanto Chemical Co., 812 Monsanto Ave., warehouse Bldg. 51, $100,000. Gilbert Small Co., Inc., 10 State St., Boston, consult. engrs.

Mich., Nahma—FACTORY—American Playground Device Co., Rudie Jehn, mgr., Nahma, 70,000 sq. ft. brick, concrete factory, $400,000.

Mo., St. Louis—GARAGE—Mandel Investment Co., M. H. Mandel, pres., c/o 901 Chestnut St., Zone 1, conversion 3 story, bsmnt., brick building at southeast corner of 10 and St. Charles Sts. into 5 story, bsmnt., automobile parking garage addn. to existing garage, east on St. Charles St., $100,000, Neal J. Campbell, 911 Locust St., Zone 1, consult. engr.

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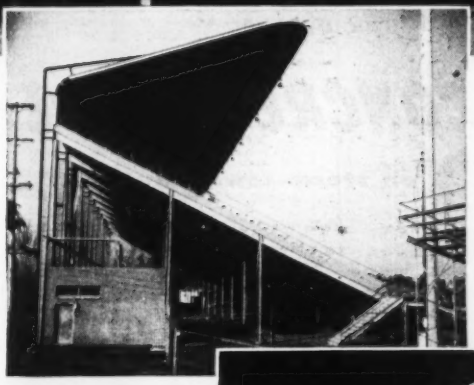

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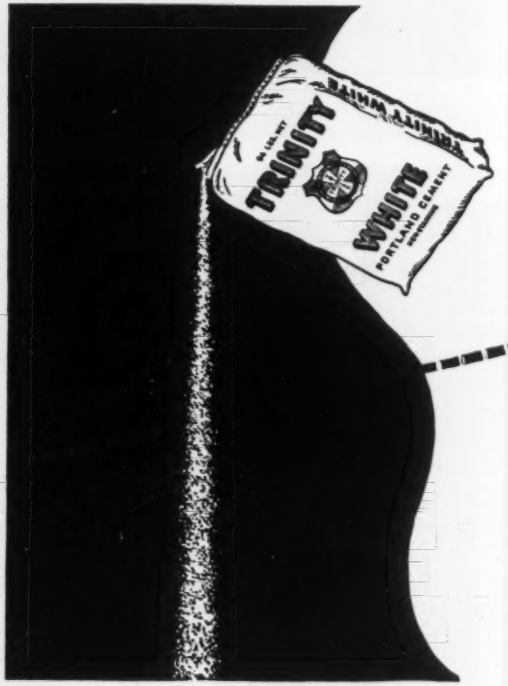

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N. C., Hickory—PLANT—Gorham Mfg. Co., 333 Adelaide St., Providence, R. I. mfg. plant. Approx. $150,000.

N. C., Raleigh—SALES and SERVICE—K. & W. Motors, Inc., 118 E. Davie St., rebuild auto sales and service. $200,000.

▲ O., Cleveland—PLANT—The Champion Forge Co., 3685 E. 78 St., plant expans. $4,000,000.

▲ O., Jackson—FACTORY—The Globe Iron Co., Jackson, 1 story 200x250 ft. all-steel factory to mfg. ferro-steel alloys, near Beverly. $2,000,000.

Okla., Oklahoma City—PLANT—Cain Coffee Co., 1 W. 12 St., coffee roasting plant. $100,000.

▲ Pa., Jeannette—FOUNDRY—The Elliott Co., Jeannette, 2 story brick, steel frame foundry addn. $1,000,000.

▲ Tenn., Columbia—PLANT—Union Carbide & Carbon Corp., Columbia, plant addns. $2,500,000.

Tex., Corpus Christi—SHOP—Gulf Chevrolet of Corpus Christi, 414 N. Walter St., truck repair shop. $279,400.

Tex., Midland—REPAIR SHOP—Humble Oil & Refinery Co., Midland, equip. and machinery repair shop. $200,000.

▲ Tex., Paris—POWER PLANT—Texas Power & Light Co., Interurban Bldg., Dallas, 80,000 kw main electric power plant to be called "River Crese Steam Electric Station" $4,800,000, 30 mi. southeast of here.

▲ Tex., Stamford—GENERATOR UNIT, etc.—West Texas Utilities Co., Abilene, 33,000 kw turbo-generator unit on Paint Creek Reservoir, 16 mi. northeast of here, $2,000,000; addnl. steam generating electric power plant units, $4,000,000.

Tex., Sulphur Springs—SUB STATION—Texas Power & Light Co., Interurban Bldg., Dallas, electric power sub-station, 40 mi. northeast, $375,000.

▲ Utah, Salt Lake City—RESEARCH LABORATORY—Kennecott Copper Co., Kearns Bldg., plans by Ashton, Evans & Brazier, 26 West S. Temple St., construct Mines Research Laboratory on the University of Utah Campus., etc. $1,250,000.

▲ Wyo., Manderson—PLANT—General Petroleum Corp., 108 W. 2 St., Los Angeles 12, Calif., natural gasoline plant, $2,750,000; sulfur-extraction plant, $750,000; 8- to 24-in. field gathering lines from fields to sulfur and gasoline refinery plants, $450,000.

UNCLASSIFIED

Calif., Berkeley—PARKING LOT—City, City Hall, municipal parking lot at Telegraph Ave. Durant and Channing Way, $156,000.

▲ Fla., Fernandina—RECREATION FACILITIES—Bd. Freeholders, Fernandina Port Authority, Fernandina $2,500,000 bond election April 4, additional recreation facilities, incl. yacht basin, golf course, auditorium, swimming pool, tennis courts, parking facilities, playgrounds, service bldg., over Buccaneer Trail, along the coast between Fernandina and Mayport.

Ill., Salem—GAS LINE—City, c/o City Council, constr. etc. 13 mi., 4½ mi. O.D. steel pipe coated and wrapped for natural gas to tap Texas-Illinois Natural Gas Co., pipe line north of Sandoval $251,000. DeLeuw, Cather & Co., 150 N. Wacker Dr., Chicago, Ill., engrs. CD 3/5.

Minn., Minneapolis—PARADE GROUNDS—City, Bd. Park Comrs., City Hall, C. E. Doell, supt., landscaping at Parade, also lights, on baseball diamond, portable bleachers, curb and gutter, $115,000, E. Braddock, city engr. CD 4/10/44.

Nebraska—RURAL DISTRIBUTION LINES—Northeast Nebraska Rural Public Power Dist., Emerson, 345 mi. rural distr lines, Thurston, Dixon, Dakota, Wayne and Cedar Counties, $425,000; 151 mi. rural distr. lines, Dixon, Dakota and Thurston Counties. $200,000. Henningson, Durham & Richardson, Standard Oil Bldg., Omaha, consult. engrs. CD 1/3/47.

New Mexico—PIPE SYSTEM, etc.—El Paso Natural Gas Co., Bassett Tower, El Paso, Tex., gas collection field pipe sys., $125,000; gas booster pumping station, $150,000 San Juan area.

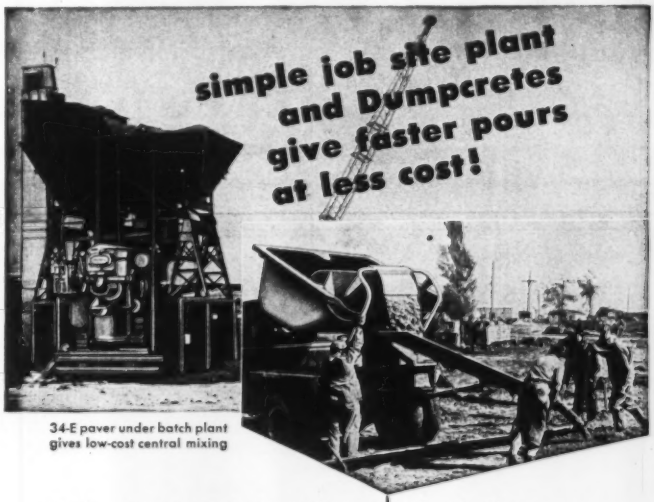
▲ Texas and Louisiana—OIL LINE—Cities Service Pipe Line Co., Bartlesville, Okla., 105 mi. 18 in. crude oil line from Sour Lake to near Lake Charles, La. $6,125,000.

▲ Tex., Burnet—TOURIST CENTER—State Park Bd., State Bldg., Austin, plans by Page, Southerland & Page, 602 West Ave., Austin, tourist center, main lodge, cabins, 800 ft. bathing beach, boat docks, bathhouses, picnic and recreation grounds, outside utilities, etc., at Inks Lake on Colorado River, near here. $1,000,000. CD 12/21.

Tex., Midland—PIPE LINES—Humble Oil & Refining Co., Midland, oil well and field connecting crude oil gathering pipe lines, $500,000; crude oil pipe line main from central field point northwest to refinery, $350,000.

Tex., Paris—POWER LINES—Texas Power & Light Co., Interurban Bldg., Dallas, electric power lines in general area of proposed power plant, 30 mi. southeast of here. $300,000.

▲ Puerto Rico—ELECTRIC DISTRIBUTION LINES—Puerto Rico Water Resources Auth., San Juan, 1,652 mi. electric distr. line, 50 mi. 18-kv transmission line and sub-stations, San Juan. $6,376,000. CD 10/30/50.



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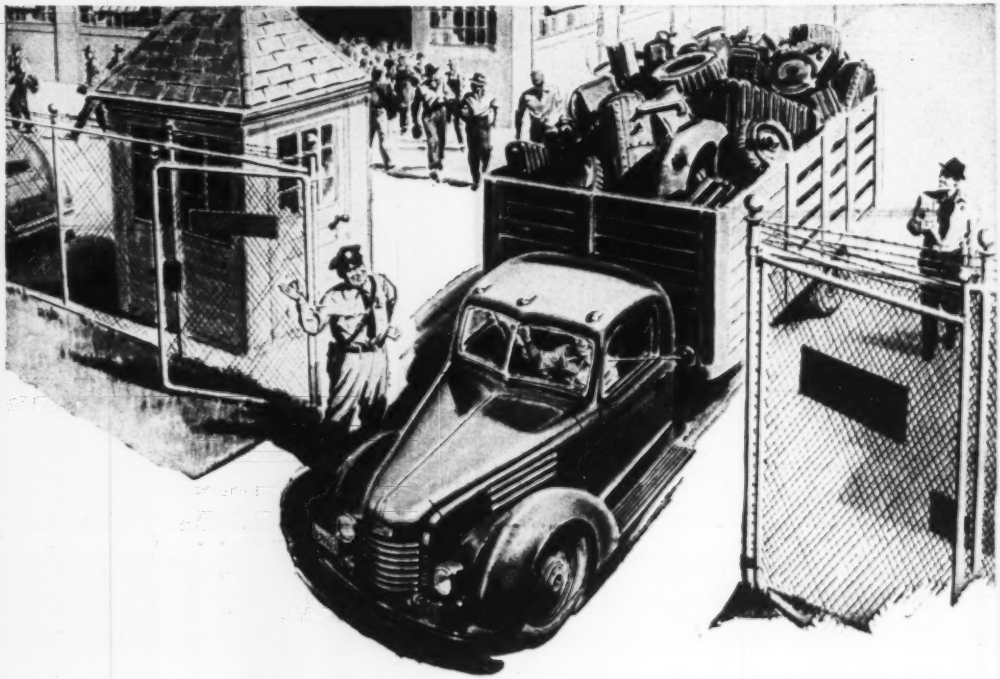

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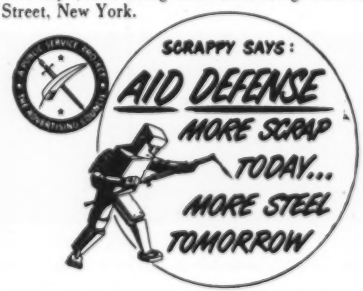

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Bids—Low Bids—Contracts—Second Section

NEW ENGLAND

BIDS ASKED—HEAVY CONSTRUCTION

R. I., Newport—B.A. 4/23—City, City Hall, Cont. A, Long Wharf sewage pump station; Cont. C, construct sewers, drain, force mains and appurtenances. Plans deposit $25. CD 6/25.

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **Patrick Beresford,** 269 Spring St., Medford, Mass. CA $1,000,000, parochial grammar and high SCHOOL, Old Pratt Estate, CONCORD, MASS. Archdiocese of Boston, Lake St., Brighton, Mass. McGann & Powers, 419 Boylston St., Boston, Mass., archts. CD 7/10/51.

Theodore Loranger & Son, 404 Nash Rd., New Bedford, Mass. CA $300,000. 2 story, 70x100 ft. CONVENT addn., NEW BEDFORD, MASS. Mt. Carmel Convent, R. C. Diocese of Fall River, Highland Ave., Fall River, Mass.

▲† **B. Perini & Sons, Inc.,** 73 Montvait Ave., Framingham, Mass., LB $2,607,318, four WAREHOUSES and Property Office, Naval Advance Base Supply Depot. Spec. 32576. DAVISVILLE, R. I. Dist. Pub. Wks. Office, First Naval Dist., 495 Summer St., Boston, Mass. Bids March 11. CD 2/29.

▲ **E & F Constr. Co.,** 94 Wells St., Bridgeport, Conn., CA, $8,094,000, MR-40 moderate rental HOUSING Project Trumbull Ave. off Reservoir Ave., BRIDGEPORT, CONN. City Housing Auth., 252 Hallett St., Bridgeport, Conn. Bids Feb. 28. CD 3/6, under LB.

Town, School Bldg. Comm., East Hartford, Conn., rejected bids Mar. 5. Goodwin SCHOOL ADDNS., alterations, LB, $417,000, EAST HARTFORD, CONN. CD 3/13, under LB.

Anderson-Fairoaks Constr. Co., 146 S. Marshall St., Hartford, Conn., LB, $788,500, PHA 18-1, HOUSING Sunset Park, NORWICH, CONN. City Housing Auth., 242 Main St., Norwich, Conn. Bids Mar. 13. CD 3/3.

MIDDLE ATLANTIC

BIDS ASKED—HEAVY CONSTRUCTION

† **N. J., Bayonne**—RAILROAD TRACK—B.A. 4/1—P. Wks. Office, Third Naval District, 90 Church St., New York, 7, N.Y., installation of railroad track [illegible] street, Naval Supply Depot, Spec. No. 31931, NOY 70344. Plans deposit $10.

N. Y., Jones Beach—PARKING FIELD—B.A. 4/11—Long Island State Park Comm., Administration Headquarters, Belmont Lake State Park, Babylon, enlarging Overlook Parking Field No. 2, Jones Beach State Park, near Wantagh.

BIDS ASKED—BUILDINGS

▲ **N. Y., Long Beach**—SCHOOL—B.A. 4/1—Bd. Educ., Union Free School Dist. 28, Long Beach, Elementary School No. 5. est. $2,000,000. Extended date. CD 2/13.

N. Y., Brooklyn—DINING FACILITIES—B.A. 4/2—Dpt. P. Wks., Municipal Bldg., New York, Zone 7, Cont. 1, general const., Cont. 2, plumbing, Cont. 3, heating and ventilating, Cont. 4, electrical for addnl. dining facilities over existing central kitchen at Kings County Hospital. Plans deposit $25. CD 3/5.

† **N.Y., Brooklyn**—BUILDING IMPRVS.—B.A. 4/3—Pub. Wks. Office, Third Naval Dist., 90 Church St., New York Zone 7, main refrigerator Bldg. No. 300 alterations and imprvs. at Naval Receiving Station. NOY 72072. Spec. 33373.

† **D. C., Wash.**—BUILDING ADDN.—B.A. 4/8—Dist. P. Wks. Office, Potomac River Naval Command, Naval Gun Factory Building No. 16 addn., Spec. 32157, NOY 70568 Plans deposit $20.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

Garofano-H. Quist Const. Co., 8410 Third Ave., Brooklyn 9, N. Y., CA. $517,363, bulkhead wall from 135 to 138 Sts., Harlem River Dr. NEW YORK, N. Y. President Manhattan Boro, Municipal Bldg., New York 7, N. Y. Bids Jan. 3. CD 12/26.

▲ **American Bridge Co.** 71 Broadway, New York, N. Y. CA superstructure for bridge over Harlem River at E. 133 St., NEW YORK, N. Y. New York Central System, G. A. Noren, ch. engr., 466 Lexington Ave., New York 17, N. Y. Bids Feb. 6. CD 12/19.

NEW JERSEY State Hy. Dpt., 1035 Parkway Ave., Trenton, N. J.

Spearin, Preston & Burrows, Inc., 50 Church St., New York, N.Y., CA, $799,721, widn. bridges over Overpeck Creek Erie R.R. (Northern Branch) and Grand Ave. on Route 6, Section 1, Ridgefield and Ridgefield Park, Bergen Co. Bids Mar. 11, awarded Mar. 18, CD 3/13, under LB.

L. Palombo & Sons, 1600 Washington Rd., Pittsburgh, Pa., LB $75,877. est. $80,000. sewers and paving, Forest Ave., WEST HOMESTEAD, PA. West Homestead Boro, Pittsburgh, Pa.

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **Western Reserve Building Co.,** 420 Main Ave., S. W., Warren, O., CA. $1,075,540, general const. Simon Perkins Junior HIGH SCHOOL and gymnasium, AKRON, O. Bd. Educ., 70 N. Broadway, Akron, O. Bids Feb. 25. Awarded Mar. 10. CD 1/31.

Hillsmith & Co., 124 E. 3 St., Dayton, O., CA. 2 story, 20,000 sq. ft. brick FACTORY, on Leo St. between Stanley and McCook Aves., DAYTON, O.

Hagerman Constr. Co., Strauss Bldg., Fort Wayne, Ind., LB, $464,000, elementary SCHOOL and gymnasium, Pettit Park, KOKOMO, IND. School City of Kokomo, Kokomo, Ind. Bids Mar. 13. CD 2/19

Tonn & Blank, Inc., 104 N. Franklin St., Michigan City, Ind., CA, $300,000 Jewish TEMPLE, MICHIGAN CITY, IND. Sinai Temple Congregation, East Gardena and Wilshire Sts., Michigan City, Ind. Awarded Mar. 11. CD 1/4

▲ **Bedford Constr. Co.,** 201 N. Wells St., Chicago, 1, Ill., CA, $1,178,000, grain PROCESSING Unit; CA, $675,000, dextrine production unit, ARGO STATION ILL. Corn Products Co., 201 N. Wells St., Chicago, Ill. Awarded Mar. 12.

▲ **Robin Constr. Co.,** 1333 N. Wells St., Chicago 10, Ill., LB $2,899,000, 49 row HOUSES Incl. 200 units CHICAGO, Ill. Chicago Housing Auth., 608 S. Dearborn St., Chicago, 5, Ill. Bids Feb. 28. CD 1/25

▲ **A. L. Jackson Co.,** 161 E. Erie St., Chicago, 11, Ill., CA, $1,900,000, 2 and 4 story, T-shaped, 158x228 ft., face brick, stone Weiss HOSPITAL, CHICAGO, ILL. L. A. Weiss Foundations c/o Loebl, Schlossman & Bennett, archts., 430 N. Michigan Ave., Chicago, 11, Ill. Bids Nov. 6. CD 10/23

Milton H. Calner Inc., 209 N. La Salle St., Chicago, 1, Ill., CA, $90,000 FACTORY, CHICAGO, ILL. Supreme Products Inc., 2238 Calumet Ave., Chicago, Ill. Lester Greenwald, 209 N. La Salle St., Chicago, 1, Ill., archts. Awarded Mar. 14.

Campbell-Lowrie-Lautermilch, 400 Madison Ave., Chicago, 6, Ill., CA, $980,000, Bremen Community high SCHOOL at 16915 S. Oak Park Ave., MIDLOTHIAN, ILL. School District 228, Midlothian, Ill. Bids Mar. 4. CD 3/18, under LB

R-W Constr. Co., 4212 N. 124 St., Milwaukee 16, Wis., Owner Builds, $350,000, 40,000 sq. ft., concrete, brick block gun PLANT, MILWAUKEE, WIS. Chain Belt. Co., 4701 W. Greenfield Ave., Milwaukee, 14, Wis., lessee.

Rose-Hill Realty, Inc., 13324 W. Seven Mile Rd., Detroit, Mich. Owner Builds. $425,000 sixty-four 2 story brick APARTMENT units, Woodward and Lincoln Sts., HUNTINGTON WOODS, MICH.

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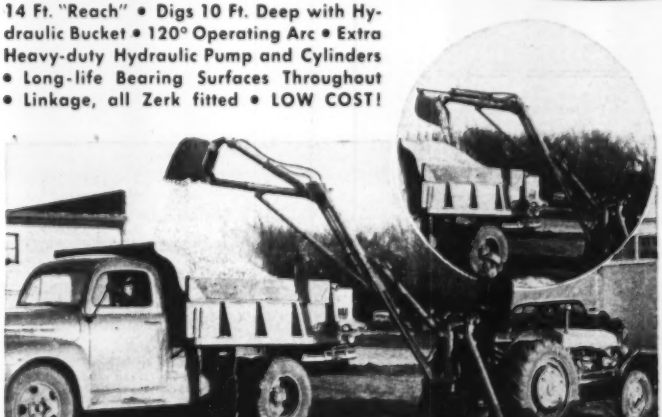

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BUILDINGS

LOW BIDS AND CONTRACTS

▲ **Stratford-on-The-Highlands Homes**, c/o Alwin Cassens, Jr., archt., 145 S. Franklin Ave., Valley Stream, N. Y. Owner builds. $1,000,000. 48 HOUSES on Highland Rd. GLEN COVE, N. Y.

David Stein, c/o Karl Bloch, archt., 7 Landsdown Ave., Merrick, N. Y., Owner builds. $500,000. 50 HOUSES on 10-acre site near Broadway and Jerusalem Rd. MASSAPEQUA, N. Y.

Wayne Development Co., c/o Schuman & Lichtenstein, archt., 369 Lexington Ave., New York, 17, N. Y. Owner builds. Approx. $370,000. 37 HOUSES on tract near Oceanside Golf Course, OCEANSIDE, N. Y.

Bengo Homes, Inc., c/o Behrco Realty Service Corp., 107 W. Sunrise Hy., Freeport, N. Y. Owner builds. $750,000. 42 HOUSES on tract on Westlake Ave., ROCKVILLE CENTER, N. Y.

▲ **Colonial Park Builders, Inc.**, 521 Park Ave., New York 17, N. Y. Owner builds. Approx. $2,000,000. 80 HOUSES on 35-acre tract near Boston Post Rd. and Cross County Parkway, RYE, N. Y. Angelo M. Riccio, c/o owner, archt.

Deluca Const. Co., 27 Crescent St., Glenbrook, Conn., CA, $537,837, elementary SCHOOL, SCHENECTADY, N.Y. Bd. Educ., 108 Union St., Schenectady, N.Y. Bids Feb. 21. Awarded Mar. 7. CD 1/30.

▲ **Saddle Ridge Estates**, c/o Joseph I. Schafran & Charles Goldman, archts., 200 W. 72 St., New York 23, N. Y. Owner builds. $7,500,000. 400 HOUSES on tract at Peninsula Blvd. and Saddle Ridge Rd., WOODMERE, N. Y.

Henry A. Knott, Inc., 2107 N. Charles St., Baltimore, Md. CA $682,500. est. $700,000. eighty-five 2 story HOUSING units, incl. three 17x82 ft. units, one 27x83 ft. unit, one 27x99 ft. unit, Eastport Sect., ANNAPOLIS, MD. Annapolis Housing Auth., 89 College Ave., Annapolis, Md. CD 2/13 under LB.

▲ **Victor R. Beauchamps**, 6837 4 St. N.W., Wash., D.C., LB, $2,641,890. 256 unit Highland DWELLING addn., Project DC-1-16, Wash., D.C., National Capitol Housing Auth., 1782 L St. N.W., Wash., D.C. Bids Mar. 18. CD 3/6

SOUTH

BIDS ASKED—HEAVY CONSTRUCTION

Fla., Miami—B.A. 4/3—Water & Sewer Bd. of Miami, 3342 Dinnery Key Dr., Miami. Contract SW 17, mfg. and supplying 8.5 miles 30 to 48-in. concrete water pipe. Plans deposit $10.

La., Lockport—B.A. 4/3—Lafourche Parish Waterworks Dist., raw water supply line, finished water supply line and water distr. sys. Plans deposit $50, J. B. McCrary Co., Inc., Atlanta Federal Savings Bldg., Atlanta, Ga., engr.

N. C., Forest City—B.A. 4/3—Town, sewage d'sposal plant. Plans deposit $10. Harwood Beebe Co., Montgomer Bldg., Spartanburg, S. C. engr.

† **S. C., Greenville**—INSTRUMENT LANDING SYSTEM—B.A. About 4/7—Civil Aeronautics Admin., Dpt. Commerce, 50 Seventh St., N. E., Atlanta 5, Ga., instrument landing sys. at the Municipal Airport. No. 22-236. CD 1/15/45.

La., Harahan—B.A. 4/7—town, c/o mayor, street paving and drainage. Plans deposit $15, E. G. Roessel, 2922 Metoirie Rd., New Orleans, engr.

† **N. C., Wilmington**—TOWER—B.A. About 4/7—U. S. Eng., 308 Customhouse, Wilmington, allied facilities for 625 ft. tower, near here, clearing, grubbing, stabil. of access road and parking area test lot, misc. items, incl. exterior electrical work. Serial No. Eng 31-075-52-18. CD 2/6.

† **Va., Norfolk**—PAVING—B.A. 4/8—Pub. Wks. Office, Headquarters, Fifth Naval Dist., U. S. Naval Base, Zone 11, resurf. and relocate East Field Blvd. at the U. S. Naval Air Station. NOY 70247, Spec. 30162. Plans deposit $10.

† **Ga., Atlanta**—B.A. 4/10—Purch. Office, Atlanta General Depot, U. S. Army, Atlanta, resurfacing roads and aprons at Atlanta General Depot, QM 00-030-52-128.

Tenn., Maryville—B.A. 4/14—Blunt Co., c/o county engr., Court House, concrete steel bridge over Little River east of Townsend. Plans deposit $25. CD 10/18.

† **Mississippi**—B.A. 4/15—U. S. Eng., P.O. Box 60, Vicksburg, clearing Grenada Reservoir on Skuna and Yalobusha Rivers in Grenada and Yalobusha Counties, CIVENG 22-052-52-141. CD 1/25/46.

† **Fla., Key West**—B.A. 4/17—Dpt. Navy, Officer in Charge Construction, Box 365, Naval Base, S. C., waterfront imprvts. at Naval Station, NOY 70642. Extended date. CD 2/21

† **N. C., Fort Bragg**—B.A. About 4/24—U. S. Eng., 308 Customhouse, Wilmington, motor pool imprvt. and street surf., approx. 65,000 cu. yds. grading, approx. 100,000 sq. yds. tar stabil. and double penetration bit. surf. coat in the RTC area. Serial No. Eng 31-075-52-17. CD 1/16 under LB.

† **Ga., Albany**—DISTRIBUTION SYSTEM—B.A. 4/24—Dpt. Navy, Officer in Charge of Construction, Box 365 Naval Base, S. C., construction of electrical and gas distribution system at Marine Corps Depot of Supplies NOY 70666. Plans deposit $50. CD 2/5/51, under Public Buildings

BIDS ASKED—BUILDINGS

La., Lake Arthur—SCHOOL—B.A. 4/3—Jefferson Davis Parish School Bd., Lake Arthur Negro School. Plans deposit $50, Barron, Heinberg & Brocato, Guaranty Bank Bldg., Alexandria, archts.

La., Alexandria—SCHOOL—B.A. 4/4—Rapides Parish Schol Bd., high school, Forest Hill, Plans deposit $25, C. Scott Yeager, P.O. Box 1105, archt. CD 3/19.

Va., Suffolk—HEALTH CENTER—B.A. 4/7—City, health center. Plans deposit $25. Paul D. Woodward, 716-A Boush St., Norfolk, archt.

Ky., Louisville—WAREHOUSE—B.A. 4/7—Standard Oil of Kentucky, Fifth and Bloom Sts., 2 story, 221x142 ft., brick, rein.-con. warehouse, $500,000, W. E. Glossop, Starks Bldg., archt.

† **Ala., Camp Rucker**—HOUSING—B.A. 4/8—Purch & Contg. Office, Bldg. 1113, Camp Rucker, 100 prefabricated housing units and 200 trailer units. Plans deposit $50. Paul W. Hofferbert, Gadsden, Ala., archt. Extended date. CD 3/3.

† **Va., Norfolk**—BUILDING REPAIRS—B.A. 4/8—Pub. Wks. Office, Headquarters, Fifth Naval Dist., U. S. Naval Base, Zone 11, repairs to Bldg. Z-107 at the U. S. Naval Base (Naval Supply Center). NOY 70256, Spec. 32530. Plans deposit $10.

Va., Staunton—HEATING PLANT—B.A. 4/8—State Dpt. Mental Hygiene and Hospitals, 9 N. 12 St., Richmond, heating plant addns. at DeJarnette State Hospital. Plans deposit $12.

† **Va., Yorktown**—UTILITY BUILDING—B.A. 4/8—Pub. Wks. Office, Headquarters, Fifth Naval Dist., U. S. Naval Base, Norfolk, Zone 11, utility bldg. at the U. S. Naval Schools (Mine Warfare) NOY 71298. Spec. 32866. Plans deposit $10.

Ala., Birmingham—SCHOOL ADDNS.—B.A. 4/9—City Bd. Educ., City Hall, Birmingham, South Pratt School addns. Warren, Knight & Davis, Protective Life Bldg., Birmingham, Ala., archts. CD 8/25/44.

† **Ga., Fort Benning**—SHOP—B.A. 4/9—U. S. Eng., Post Office Bldg., Savannah, engineer shop and classroom bldg., ENG 09-133-52-74. Plans deposit $10. CD 2/5, under LB.

Ga., Americus—HOSPITAL ADDNS.—B.A. 4/10—Americus & Sumter County Hospital, Americus, Ga., hospital addns. Chas. H. McCauley, Jackson Bldg., Birmingham, Ala., archt. Extended date. CD 2/19.

Ga., Mount Berry—DORMITORY—B.A. 4/10—The Berry Schools, Mount Berry, Ga., boy's dormitory. Plans deposit $10. Cooper, Bond, Cooper, Henry Grady bldg., Atlanta, Ga., archts.

Fla., Miami—HOSPITAL ADDNS.—B.A. 4/15—Dade Co. Bd. Comrs., Court House, Miami, Jackson Memorial Hospital Addns., $300,000. Plans deposit $85, Steward & Skinner, 223 S.E. 1 St., Miami, archts.

† **Miss., Gurtport**—STOREHOUSE—B.A. 4/17—Dpt. Navy, Officer in Charge of Constr., Box 365, Naval Base, Charleston, S. C., alterations, repairs to U. S. Naval Storehouse, NOY 71500. Plans deposit $10.

▲ **Tenn., Knoxville**—CHEMISTRY BLDG.—B.A. 4/22—University of Tennessee, Administration Bldg., chemistry bldg. $1,000,000. Extended date. CD 2/26.

▲ **Ga., Savannah**—HOUSING—B.A. 4/23—U. S. Engr. Office, South Atlantic Division, P. O. Bldg., Atlanta, Ga., construct, manage and finance, 500 Wherry Act housing units for personnel of Hunter Air Force Base $4,000,000. CD 2/29.

Va., Courtland—JAIL—B.A. 4/25—Southampton Co. Bd. Supvrs., Court House, jail. Plans deposit $25. Carneal & Johnston, Atlantic Life Bldg., Richmond, archts.

▲ **La., New Orleans**—HOSPITAL—B.A. 4/30—Alton Ochsner Medical Foundation, 607 Gravier St., hospital, $5,000,000. Plans deposit $150, Ellerbe & Co., E. 505 First National Bank, St. Paul, Minn., archts.

▲ **S. C., Charleston**—TEACHING HOSPITAL—B.A. 5/15 Medical College, State of South Carolina, Charleston, 400,000 sq. ft. teaching hospital. Plans deposit $100. Hopkins, Baker & Gill, Florence, archts. CD 6/29/50.

S. C., Moncks Corner—GENERATING PLANT—B.A. About 5/1—South Carolina Public Service Auth., Moncks Corner, superstructure of 96,000-kw steam & electric generating plant. Ford, Bacon & Davis, Inc., 39 Broadway, New York, N. Y. engr.

Va., Lexington—HOSPITAL—B.A. About 5/1—City, Lexington, Stonewall Jackson Hospital. $610,000. York & Sawyer, 101 Park Ave., New York, N. Y., archts. CD 2/24/50.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲ **V. B. Higgins Co.**, Greensboro, N. C. CA. $1,432,940, Sugar Creek Sewage treatment plant addns., CHARLOTTE, N. C. City, City Hall, 600 E. Trade St., Charlotte, N. C. Bids March 12.

† **Langston Constr. Co.**, Box 3031, Orlando, Fla., LB $475,540, roads and parking areas, Pinecastle Air Force Base, Eng 08-123-52-111, ORLANDO, FLA. U. S. Eng., P. O. Box 4970, Jacksonville, Fla. Bids Mar. 6. CD 2/12.

▲† **L. B. Strandberg, Inc.**, 608 S. Dearborn St., Chicago, Ill. LB $1,124,391, complete work on Floodwall, Ashland, KENTUCKY. CIVENG 46-022-52-50. U. S. Eng., 237 Fourth Ave., Hintington 18, W. Va. Bids Mar. 13. CD 2/18.

▲ **Codell Const. Co.**, Box 61, Winchester, Ky., and Oman Const. Co., Ackten Park, Nashville, Tenn., CA $2,000,000, modernization of Radnor Yards, NASHVILLE, TENN. Louisville & Nashville R. R. Cl., L. L. Adams, ch. engr., 908 West Broadway, Louisville 1, Ky. Awarded Mar. 18. CD 1/22.

BUILDINGS

LOW BIDS AND CONTRACTS

Harmon Const. Co., 100 S. Indiana St., Oklahoma City, Okla., CA. $978,000. HIGH SCHOOL, BRISTOL, VA. City, Bristol, Va. Bids March 12. CD 1/23.

▲ **B. F. Parrott Co.**, 811 Boxley Bldg., Roanoke, Va., CA, $1,297,300, 3 story, bsmnt., brick, block general HOSPITAL, PHILLIPI, W. VA. Broadus Hospital Corp., Phillipi, W. Va. Bids Feb. 28. CD 3/13, under LB.

Fred J. Wiggins, 1300 Central Ave., Charlotte, N. C. Owner builds. Approx. $600,000. 92 RESIDENCES, CHARLOTTE, N. C.

▲ **Knox Corp.**, Thomson, Ga., Owner Builds. Approx. $7,500,000. 1,800 RESIDENCES on Edgewood Rd., NORTH AUGUSTA, S. C.

J. H. Suitenfuss, 808 Baker St., Tampa, Fla., CA $550,000. CHAPEL - AUDITORIUM - GYMNASIUM, TAMPA, FLA. Academy of Holy Name Catholic School, 3319 Bayshore Blvd., Tampa, Fla.

▲ **Freeport Sulphur Co.**, Freeport, Tex. Own Forces. Approx. $7,500,000. Development of sulphur mining PLANT, Garden Island Bay Dome near mouth of Mississippi River; approx. $6,750,000. Development of sulphur mining PLANT, Bay Saint Elaine Dome, NEW ORLEANS, LA. CD 8/28/51.

Whittenberg Constr. Co., S. Floyd St., Louisville, Ky. CA $500,000. 60 addnl. HOUSING units to Arcadia subdivision, Taylor Blvd., LOUISVILLE, KY. Gil H. Whittenberg, S. Floyd St., Louisville, Ky. Awarded Mar. 17.

Dahlem Constr. Co., Inc., 984 Baxter Ave., Louisville 4, Ky. CA $500,000. truck TERMINAL, OFFICE and GARAGE, 7 Street Rd., LOUISVILLE, KY. Riss & Co., 1601 N. W. Parkway, Louisville, Ky. Awarded Mar. 18. CD 3/20.

Owensboro Municipal Housing Comm., Owensboro, Ky. rejected bids Mar. 4. 50 housing units, OWENSBORO, KY. LB $563,853. CD 2/11.

▲ **S & W Const. Co.**, Shrine Bldg., Memphis, Tenn., CA $3,349,733, 450 HOUSING units, Tenn 1-6, MEMPHIS, TENN. Memphis Housing Auth., 264 N. Lauderdale St., Memphis, Tenn. Bids Feb. 29. CD 3/18, under LB.

MIDDLE WEST

BIDS ASKED—HEAVY CONSTRUCTION

O., Perrysburg—B.A. 4/8—Village, Pub. Affairs Bd., Perryville, water supply, 12,850 ft. 16 in. water mains and appurtenances, approx. 1,500 ft. to submarine across Maumee River, 500,000 gal. rein.-con. reservoir and pumping station, 250,000 gal. elevated tank; 28,200 ft. 8, 10 and 12 in. feeder mains; 11,299 ft. 4 and 6 in. local mains with appurtenances. Plans deposit $25. CD 5/1/51.

Mich., Detroit—B.A. 4/15—City, Carl D. Warner, comr., Dpt. P. Wks., Guardian Bldg., Group RR 52-1, removing street car rails, refilling, resurf. with conc. parts of Harper, Henry, Madison and Woodmire Sts., George R. Thompson, city engr. CD 12/17.

† **Ill., Savanna**—B.A. 4/15—U. S. Eng., Clock Tower Bldg., Rock Island, Ill., imprvts. to water distribution system, involving 22,272 ft. 8-in. to 12-in. watermains, 41 gate valves, and boxes, etc. at Savanna Ordnance Depot, Proving Ground 10 mi. northwest of here. Inv. No. ENG 11-117-52-4. CD 6/29, under Unclassified.

Ill., Gilman—B.A. 4/21—City, Albert Mulder, Mayor, and George W. Fiets, clk., (a) water system incl. well, turbine, pump, well house, 13,250 ft. 2 to 6-in. c.i. mains, etc. (b) sewerage system imprvt., $75,000. Plans deposit $20. Warren & Van Praag, Inc., 253 S. Park St., Decatur, Ill., engrs. CD 2/29.

† **Ill., Chicago**—QUARTERS, etc.—B.A. 4/22—U. S. Eng., 520 Merchandise Mart, Chicago, 54, Ill., bachelor officers quarters, officers mess, technical training bldg. and barracks, O'Hare Field. Extended date. CD 3/12.

† **Ill., Rantoul**—COLD STORAGE, etc.—B.A. 4/22—U. S. Eng., 520 Merchandise Mart, Chicago, 45, Ill., cold storage and meat cutting plant, Chanute Air Force Base. Extended date. CD 3/12.

† **Ill., Scott Air Force Base**—ENGINE BUILD UP BLDG.—B.A. 4/25—U. S. Eng., 520 Merchandise Mart, Chicago, 54, Ill. engine build-up bldg., at Scott Air Force Base, Belleville. Extended date. CD 3/12.

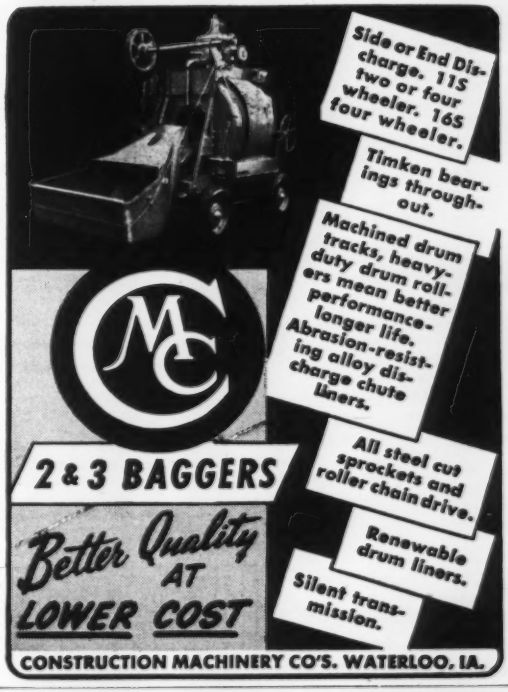
BIDS ASKED—BUILDINGS

Mich., Canton—SCHOOL—B.A. 4/7—Bd. Educ., School Dist. No. 1, Canton Twp., 2 story, brick, masonry High Elementary School, $300,000. Plans deposit $15 refundable. Earl G. Meyer, 806 Farwell Bldg., Detroit, archt.

Mich., Highland Park—HOSPITAL—B.A. 4/7—Highland Park Hospital, T. E. Shawcross, city clk., 3 story, brick, steel hospital addn., incl. modernization, alterations existing bldg. $300,000. Plans deposit $25. Clair W. Ditchy, 5 W. Larned St., Detroit, archt. CD 1/8/47.

Mich., Lansing—HEATING PLANT—B.A. 4/8—State, A. N. Langius, dir. State Bldg. Dpt., rein.-con., brick heating plant, 100 ft. chimney, equip., etc. Plans deposit $25. Extended date. Cumming & Barnard, Inc., 205 State Bank Bldg., Ann Arbor, engrs. CD 3/14.

Ill., Franklin Park—SCHOOL—B.A. 4/9—School District 84, 2836 Gustave St., Franklin Park, Ill., South Side Grade School at Nevada and Ruby Sts., $300,000. Howard T. Fisher, 322 W. Washington St., Chicago 6, Ill., archt. CD 12/26.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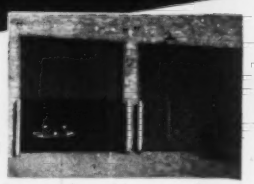

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O., Dayton—SCHOOL—B.A. 4/9—Bd. Educ., 232 N. Main St., 2 story brick, concrete Gettysburg School addn., 1825 N. Gettysburg Ave. Plans deposit $10. W. Ray Yount, 419 Third Natl. Bldg., archt. CD 11/12.

▲ **Ill., Chicago**—FACTORY—B.A. 4/11—Allied Radio Corp., corner of Washington and Western Sts., 150,000 sq. ft. factory with office, $1,250,000. A. Epstein & Son Co., 2011 W. Pershing Rd., Chicago 9, Ill., archt. Bid date changed. CD 8/28.

O., Akron—SANATORIUM ADDNS.—B.A. 4/14—Summit Co. Comrs., Court House, Edwin Shaw Sanatorium addns. and alterations. Plans deposit $15. Wagner & Luxmore, 200 Permanent Bldg., archts.

Mich., Pontiac—NURSES HOME—B.A. 4/16—State, A. N. Langius, dir., State Bldg. Dpt., Lansing, 2 story, brick, masonry nurses home, Pontiac State Hospital. $400,000. Plans deposit $25. Derrick & Gamber, 515 Hammond Bldg., Detroit, archts. CD 4/11/51.

Mich., Detroit—FACTORY—Bids Asked—The Udylite Corp., 1651 E. Grand Blvd., (selected list bidders) 1 story, 80x200 ft., brick, steel factory research in electro plating and metal finishing process. Hoover and Eight Mile Rds., $160,000. O'Dell, Hewlett & Luckenbach, 2300 Dime Bldg., Detroit, archts.

WEST OF MISSISSIPPI

BIDS ASKED—HEAVY CONSTRUCTION

Minn., Mankato—B.A. 4/7—Blue Earth County, B. E. Lee, auditor, grade, grav. 6.3 mi. between T. H. 83, 1 mi. east and 4 mi. north of Butternut, and SAR 20, 5 mi. east and 1.5 mi. north of Butternut, S. P. 07-503-02 (SAR 6), Minn. Proj. S 409 (2) and S. P. 07-513-01 (SAR 11) Minn. Proj. S 283 (5). Plans deposit $50; grade, grav. 6.1 mi. between T. H. 30 at Willow Creek and SAR 10, 3.5 mi. west of Vernon Center, S. P. 07-502-07, (SAR 20), Minn. Proj. S 76 (5). Plans deposit $2.15, $95,000, R. C. Deegan, co. hy. engr.

† **Tex., Fort Sam Houston**—LOADING DOCKS—B.A. 4/7—U. S. Govt., c/o Purchasing & Contracting Office, Bldg. 370, rein.-con. loading docks and ramp.

Minn., Crookston—B.A. 4/8—Polk Co., H. J. Welte, auditor, soil cement base and plant-mixed bit. surf. 2.2 mi. between T.H. 220 in. Northland and 2 mi. west, S.P. 60-508-02 (SAR 8), Minn. Proj. S 253 (4). Plans deposit 90c.; bridge No. 7041, 24x45 ft. beam span over Sand Hill River located 5.2 mi. east of Fertile in Polk Co.; S.P. 60-511-06 (SAR 1), Minn. Proj. S 252 (5); bridge No. 7042 24x50 ft. beam span over Sand Hill River located 3/4 mi. east of Fertile in Polk Co., S.P. 60-511-05 (SAR 1), Minn. Proj. S 252 (4). Plans deposit 70c each, $70,000, M. M. Nygaard, co. hy. engr.

Minn., Fergus Falls—B.A. 4/8—Otter Tail County, W. Lincoln, auditor, grade 1.2 mi. between CAR 40, Northeast of Pelican Rapids and 1.2 mi. east, S. P. 56-511-06 (SAR 4), Minn. Proj. S 689 (6); grade, grav. surf. 2.5 mi. between 0.5 mi. west of Almora and T. H. 29, S.P. 56-522-01 (SAR 7), Minn. Proj. S 260 (3). Plans deposit $1.10 each; grade, grav. surf. 4.8 mi. between west line of Otter Tail County and 4.8 mi. northeast, S.P. 56-527-01 (SAR 2), Minn. Proj. S 391 (3). Plans deposit $1.45, $75,000, W. P. Huber, co. hy. engr.

† **Montana**—TRANSFORMERS—B.A. 4/8—Bureau Reclamation, Dpt. Interior, Billings, 3 current and 3 potential transformers, 3 watthour recording demand meters for Wolf Point substation, Fort Peck Proj. Spec. 600S-89. L. N. McClellan, Bldg. 1A, Denver Federal Bldg., Denver, Colo., ch. engr. CD 9/8/44, under earthworks.

† **Tex., Texarkana**—WAREHOUSE—B.A. 4/8—U. S. Eng., Box 61, Tulsa 2, Okla., 200x200 ft., masonry flamable materials warehouse, concrete slab fdn. etc., Red River Arsenal. Inv. No. Eng 34-066-52-50. $375,000. CD 7/6.

† **Tex., Victoria**—BUILDINGS—B.A. 4/8—U. S. Eng., 606 Santa Fe Bldg., Galveston, Group B, 3,970 sq. ft. base communications bldg.; 1,600 sq. ft. paint and dope storage; 4,100 sq. ft. guard house, masonry const.; 7,345 sq. ft. base operations bldg., 11,830 sq. ft. crash truck and structural fire station, 3,300 sq. ft. cold storage and meat cutting bldg., 6,680 sq. ft. officers mess bldg., wood frame const. at Foster Air Force Base, Inv. No. ENG 41-243-52-91. CD 1/9.

† **Nebraska**—B.A. 4/10—Bureau Reclamation, Dpt. Interior, Superior, partial demolition of Consumers Public Power District diversion dam, earthwork for relocation of Lost Creek and removing existing timber bridge near Superior, Spec. 701C-244, Missouri River Basin Proj., Bostwick Div.

†**South Dakota**—B.A. 4/10—Bureau Reclamation, Dpt. Interior, Hot Springs, constructing basements and utilities, moving and finishing 2 residences for Angostura Govt. Camp. Spec. 600C-88, Missouri River Basin Proj. CD 5/25/44.

† **Tex., Fort Sam Houston**—B.A. 4/10—U. S. Govt., c/o Contracting & Purchasing Dpt., Bldg. 370, asph. paved parking area for Reception Center. Inv. No. E-41-133-52-70. Approx. $60,000. CD 3/19.

Wyo., Laramie—LAW SCHOOL—B.A. 4/10—University of Wyoming, Laramie, 2 story, bsmnt., brick, Law School bldg., $300,000. Hitchcock & Hitchcock, 107 S. 5 Ave., Laramie, engrs. CD 10/0.

Ia., Algona—POWER PLANT IMPRVS.—B.A. 4/11—Bd. Trustees Municipal Utilities, c/o Ira A. Kohl, secy., City Hall, municipal electric light and power plant imprvs. Plans deposit $15. Buell & Winter, Insurance Exchange Bldg., Des Moines, Ia., engrs.

† **Mo., Fort Leonard Wood**—CLASSROOM—B.A. 4/14—U. S. Eng., 601 Davidson Bldg., Kansas City 8, Mo., 9 frame classroom at Army Post, Inv. 52-41. CD 2/20.

Tex., LaMarque—B.A. 4/14—Galveston County Water control & Imprv. Dist. 3, 224 Bayou Rd., furnishing, erecting 300,000 gal. elevated water storage tank on concrete fdn. $100,000. Joe J. Rady, Box 173, Baytown, engr.

† **Missouri**—B.A. 4/15—U. S. Eng., P. O. Box 97, Memphis 1, Tenn., 240,000 cu. yd. riverside enlargement, topping, roadway, embankment, artificial berm Levee Item No. R-872, Stewart, Levee Stations 8 plus 6, 12 plus 0, lower St. Francis Levee, right bank of Mississippi River in Pemiscot Co., CIVENG 40-041-52-80. CD 6/1/44.

† **Colo., Pueblo**—WAREHOUSE—B.A. 4/16—U. S. Eng., 1709 Jackson St., Omaha, Nebr., constr. flammable material warehouse, Pueblo Ordnance Depot, Eng 25-066-42-72. CD 9/21.

† **Tex., Austin**—OFFICERS MESS—B.A. 4/18—U. S. Eng., 606 Santa Fe Bldg., Galveston, approx. 14,000 sq. ft. wood frame officers' mess bldg. Bergstrom Air Force Base, Inv. No. ENG 41-243-52-87. CD 1/10.

† **New Mexico**—B.A. 4/30—U. S. Eng., 2134 E. Central Ave., Albuquerque, Jemez Canyon Dam and Reservoir Embankment and spillway, 29-005-52-9. CD 3/19.

Neb., Omaha—PARKING BUILDING—Bids Asked—Union Stock Yards Co., Exchange Bldg., 2 story concrete addn. to present recently constructed parking bldg. $80,000. John Erixon, c/o owner, engr.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲† **Mississippi Valley Engr. & Constr. Co.**, 787 South Willett St., Memphis, Tenn., LB, $1,131,890, two lots of work on Arkansas River four miles upstream from Fort Smith involving pile and standard revetment and pile construction, CIVENG 03-050-52-53. ARKANSAS U. S. Eng., 300 Broadway, Little Rock, Ark. Bids Feb. 27. CD 1/30

▲† **Martin K. Eby Constr. Co.**, 610 N. Main St., Wichita, Kan. CA $4,340,965. buildings, Group A, Forbes Air Force Base, Inv. 52-34, TOPEKA, KAN. U. S. Eng., 601 Davidson Bldg., Kansas City 8, Mo. CD 2/20 under LB.

▲† **J. W. Moorman & Son**, Box 491, Snyder, Tex., LB $2,773,043. est. $3,829,660, complete embankment and construction spillway at Belton Dam and Reservoir on Leon River, incl. over 4 m. cu. yds. earth fill, Civeng 41-443-52-37. TEXAS. U. S. Eng., 1127 Texas and Pacific Bldg., Fort Worth, Tex. Bids Mar. 14. CD 2/18.

▲ **Lone Star Gas Co.**, 1915 Wood St., Dallas, Tex. Own forces. $1,052,308, construct segment of gas pipe line 1 loop, 20 in. pipe around city, DALLAS, TEX. CD 1/22.

† **Amis Const. Co.**, 2221 Irving Blvd., Dallas, Tex., CA $728,644, runways and taxiways, Sheppard Air Force Base, Inv. No. Eng 34-066-52-31, WICHITA FALLS, TEX. U. S. Eng., Box 61, Tulsa, Okla. Bids Feb. 19. Awarded Mar. 13. CD 2/27, under LB.

Worth Const. Co., 312 E. Berry St., Fort Worth, Tex., CA $671,664. est. $950,000. paving at Convair, incl. approx. 140,000 sq. yd. rein.-con. pavement, 14 in. thick for landing, FORT WORTH, TEX. Consolidated Vultee Aircraft Corp., Grants Lane, Fort Worth, Tex. Bids Mar. 7. Awarded Mar. 14. CD 3/17, under LB.

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **Sauers Constr. Co.**, 1255 Larpenteur Ave. West, St. Paul, Minn. CA $1,943,900. Junior-Senior High SCHOOL, LAUDERDALE (ST. PAUL, P.O.), MINN. Bd. Educ., Independent School Dist. No. 3, T. C. Schultz, clk., Lauderdale, Minn. CD 2/20, under LB.

Weitz Co., Inc., 406 Fleming Bldg., Des Moines, Ia., CA, $428,754, POWER PLANT ADDNS., BOONE, IA. Iowa Power & Light Co., Boone, Ia. H. R. Green Co., 417 1 Ave. S.E., Cedar Rapids, Ia. engr.

North American Steel Co., C. A. Depue, pres., Clinton, Ia., Owner Builds, $500,000, iron and coke PLANT 2 blast furnaces, 96 coke ovens, site development bldgs., dockage on Mississippi River trackage roads sewer and water sys., CAMANCHE, IA. CD 2/9/51

N. W. Wiltgen, LeMars, Ia., CA $304,783, general contract parochial SCHOOL REMSEN, IA. St. Mary's Catholic Parish, Remsen, Ia. Bids Jan. 8. CD 1/18, under CA. (Correction—contractor).

Blosser & Assoc., Crawford Bldg., Topeka, Kan. Owner Builds. $750,000. 70 defence HOUSING units for personnel of Forbes Air Force Base, TOPEKA, KAN. CD 2/20.

▲ **The Lummus Co.**, 385 Madison Ave., New York, N. Y. Design and construct, $5,500,000. aviation fuels catalytic cracking REFINERY, CORPUS CHRISTI, TEX. Sunray Oil Corp., Jones Bldg., Corpus Christi, Tex.

▲ **Phillips Chemical Co.**, Bartlesville, Okla., Own forces. Approx. $1,360,000. addnl. sulphur recovery PLANT unit, near CRANE, TEX. CD 3/13.

▲ **Hubbard Const. Co., J. T. Hubbell Const. Co.** and **Russell W. Nix**, 1507 Delano St., Houston, Tex., CA. $3,056,948, est. $4,072,500. Tex 9-11-C, 2nd unit to West Dallas HOUSING project, 82 bldgs. for total 543 units. DALLAS, TEX. Dallas Housing Auth., 2525 Lucas Dr., Dallas, Tex. Bids Mar. 10. CD 3/17, under LB.

▲ **Eastern States Petroleum Co. Inc.,** Ship Channel, Houston, Tex., Purchase and hire. Approx. $750,000, rehabilitation, reactivation HF alkylation REFINING unit; $150,000, REFINERY and Udex. unit; $1,250,000, expans. Catalytic (fluid) CRACKING unit, Grand total $3,750,000, near HOUSTON, TEX.

▲ **Texas Gulf Sulphur Co.,** Liberty, Tex., Own forces. $1,750,000. sulphur MINING PLANT, LIBERTY, TEX. CD 7/31.

▲ **Austin Building Co.,** 1000 Singleton Blvd., Dallas, Tex., CA. Approx. $2,100,000. 33,000-kw turbo generator unit for POWER PLANT, STAMFORD, TEX. West Texas Utilities Co., Abilene, Tex. CD 3/14.

▲ **N. G. Petry Constr. Co.,** 1114 W. 7 Ave., Denver, Colo., CA, $1,798,000, constr. South Lincoln Park HOUSING incl. 270 units, Colo. 1-10, 39 buildings, between W. 9 and W. 11 Aves., and Osage and Mariposa Sts., DENVER, COLO. Denver Housing Auth., 1449 Navajo St., Denver, Colo. Bid S Mar. 6, awarded Mar. 10. CD 2/6

▲ **Mead & Mount Constr. Co.,** Railway Exchange Bldg., Denver, Colo., Ca, $1,689,000, HOUSING Project Sangre de Cristo Homes, Incl. 224 units, 46 buildings North of Sprague St. between Acero and Prairie Aves., PUEBLO, COLO. City of Pueblo Housing Auth., 325 Central Bldg., Pueblo, Colo. Bids Mar. 4, awarded Mar. 10. CD 3/11, under LB

FAR WEST

BIDS ASKED—HEAVY CONSTRUCTION

Wash., Cashmere—B.A. 4/7—City, City Hall, 17,000 ft. 6 to 18-in. sewers, $90,000. Plans deposit $25. F. M. Berry, Cashmere, engr. CD 9/24.

† **Oregon**—RELOCATE CEMETERY—B.A. 4/8—U. S. Eng., Pittock Block, Portland, relocate Fairview Cemetery from Detroit Dam area, Marion Co. Civeng 35-026-52-173.

† **California**—B.A. 4/9—Bureau Reclamation, Dpt. Interior, Goleta, Calif., concrete pipe lines and structures South Coast Conduit, Carpinteria Section Station 0 plus 18.59 to Station 909 plus 09.68, Cachuma Project. Spec. DC 3666. Extended date. CD 2/19.

† **Idaho**—B.A. 4/10—Bureau Reclamation, Dpt. Interior, Idaho Falls, Idaho, Palisades Dam and Power Plant and relocation of roads, Palisades Proj., Spec. DC 3675. Extended date. CD 2/26.

† **Wash., Everett**—BUILDINGS—B.A. 4/10—U. S. Eng., 4735 E. Marginal Way, Seattle, 4, Wash., rehabilitate and repairing 19 bldgs. at Paine Air Force Base, Inv. 52-175. Extended date. CD 3/10.

† **Wash., Fort Lewis**—B.A. 4/10—Dpt. Army, Purch. & Contg. Officer, Fort Lewis, c.i. and asbestos cement pipe replacement of 1,740 ft. wood-stave watermain, Inv. 52-85. CD 7/27, under Public Buildings.

Calif., Santa Rosa—B.A. 4/14—Forestville County Sanitation Dist., Court House, sanitary sewer system for the district. Clyde C. Kennedy, 604 Mission St., San Francisco, engr.

BUILDINGS

LOW BIDS AND CONTRACTS

Calif., San Francisco—SCHOOL—B.A. 4/9—Dpt. P. Wks., City Hall, San Francisco, Twin Peaks Elementary School, $400,000. Plans deposit $75. CD 7/9.

† **Calif., Camp Beale**—DORMITORIES, etc.—B.A. 4/15—U. S. Eng., Wright Bldg., Sacramento, dormitories, other buildings Spec. 1602. Plans deposit $75.

Calif., San Diego—ADMINISTRATION, etc.—B.A. 4/15—State Div. Architecture P. Wks. Bldg., Sacramento, administration and health bldg., San Diego State College. Plans deposit $25.

▲† **Nev., Hawthorne**—MAGAZINE STORAGE—B.A. 4/16—Pub. Wks. Office, Twelfth Naval Dist., Construction Div., San Bruno, Calif., providing, securing the construction of 57 earth covered ammunition storage magazines, 4 fuse and detonator magazines at the Naval Ammunition Depot. NOY 71222. Spec. 30561. Plans deposit $100.

† **California**—TURBINES—B.A. 5/1—Bureau Reclamation, Dpt. Interior, Bldg. 53, Denver Federal Center, Denver, Colo., furnishing two vertical shaft, 9,400 horsepower, 150 rpm hydraulic turbines for Nimbus Power Plant, Central Valley Proj., Inv. No. DS-3697.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

Donald Drake Co., Lewis Bldg., Portland, Ore., CA, $90,382 4500 ft. 18- and 24-in. trunk sewer and pumping station, LONGVIEW, WASH. City, City Hall, Longview, Wash. Bids Mar. 13. CD 2/28.

Ferd Drayer, 1234 Caroline St., Alameda, Calif., LB, $224,400, 300 acres clear reservoir area of Big Carson Dam, SAN RAFAEL, CALIF. Marin Municipal water District, 874 4 St., San Rafael, Calif. Bids Mar. 11. CD 2/13.

BUILDINGS

LOW BIDS AND CONTRACTS

Oppenheim & King, Box 1902, Fresno, Calif., CA, $390,000 new Farmersville SCHOOL No. 2 Ash and O Sts., FARMERSVILLE, CALIF. Farmersville Elementary School District P. O. Box C, Farmersville, Calif. Awarded Mar. 13.

G. W. Davis, 506 Center St., Watsonville, Calif., LB $349,000, elementary SCHOOL south of Springfield School, MOSS LANDING, CALIF. Moss Landing Elementary School District, 747 Shore St., Pacific Grove, Calif. CD 2/16/51.

OFFICIAL PROPOSALS

Bids: April 1, 1952

Rail Removal

Sealed proposals will be received at the office of the Borough Secretary, City Hall, Norristown, Penna. up to 4:00 P.M. April 1, 1952 for the removal of rails in the bed of Markley Street, between Airy Street & Johnson Highway, also in the bed of Swede Street between Airy & Penn Streets. Approximate quantities as follows: 225 ton of 120 pound girder rail & 60 ton of 70 pound "T" head rail. Specifications for removal are on file in the office of the Borough Engineer, City Hall, Norristown, Penna. and all prospective bidders are requested to visit the site of the proposed rail removal prior to submitting bidding proposal. A certified check, payable to The Borough of Norristown in the amount of Five Hundred Dollars ($500.00) must accompany all bids. The successful bidder must furnish bond in the amount of Ten Thousand Dollars ($10,000.00) to comply with the contract. The Borough of Norristown reserves the right to reject any and all bids, and to award contract as it deems to the best interest of the Borough.

THE BOROUGH OF NORRISTOWN
WILLIAM S. BOWEN
SECRETARY

Bids. April 22, 1952

Raw Water Mains

Sealed bids will be received until 9:00 A.M. EST, April 22nd, A.D., 1952, by the City Commission in the City Commission Chambers at Fort Lauderdale, Florida for "Laying 8", 10", 12", 16", 18", 20", 30", and 42" Raw Water Mains".

Bidding blanks may be obtained from the office of the Engineer. Plans and specifications are on file in the office of the Engineer.

A deposit of $25.00 for plans and specifications, and of $25.00 each for additional copies of plans or specifications, will be required. All deposits for plans and specifications will be refunded upon their return in good condition within ten (10) days of the opening of bids.

A certified check for 2% of the total of the bid, made payable to City of Fort Lauderdale, Florida shall accompany each proposal as evidence of good faith and responsibility of the bidder. This check shall be retained by the payee as liquidated damages should the bidder refuse or fail to enter into a contract with the payee for the execution of the work embraced in the proposal, in the event the proposal of the bidder is accepted.

The Owner reserves the right to reject any or all bids.

H. M. LINK
City Manager

Bids: April 22, 1952

Concrete Sewer in Rock Tunnel

PHILADELPHIA, PENNA.
PROCUREMENT DEPARTMENT
WATER DEPARTMENT

Sealed proposals will be received at Room 305 City Hall Annex until 1:30 P.M., Eastern Standard Time, Tuesday, April 22, 1952, and opened at that time in Room 313 City Hall Annex, Philadelphia, Penna., for

COBBS CREEK HIGH LEVEL CUT-OFF INTERCEPTING SEWER IN SIXTIETH STREET FROM GRAYS AVENUE TO COBBS CREEK PARKWAY
CONTRACT NO. SD-141-SW
Principal item of work
3,882 feet of 8'0" diameter concrete sewer in rock tunnel

Proposal forms and specifications may be obtained in Room 1101 City Hall Annex. Blue prints of plans may be purchased at bidder's expense, directly from the Keystone Blue Paper Co., 51 North 13th Street, Philadelphia 7, Penna.

No bids will be received unless bidder is qualified by the Procurement Commissioner. The questionnaire form with all questions fully answered must be filed with the Water Commissioner at least one week prior to the date of opening bids.

Each bid must be accompanied by security in form and amount as set forth in proposal form.

CHARLES H. FRAZIER
Procurement Commissioner

OFFICIAL PROPOSALS

Bids: April 7, 1952

Passenger Arcade

THE PORT OF NEW YORK AUTHORITY
NEW YORK INTERNATIONAL AIRPORT
PASSENGER ARCADE
CONTRACT NYA-160.014

Sealed proposals for the construction of a passenger arcade at New York International Airport will be received at the office of the Chief Engineer of The Port of New York Authority, Room 1100, 111 8th Ave., New York 11, until 11:00 a.m. Monday, April 7, 1952, at which time and place said proposals will be opened and read.

Contract documents may be seen at the office of the Chief Engineer and copies will be furnished upon deposit of $25 per set. The deposit will be remitted if the documents are returned in good condition, not later than 30 days after the opening of proposals.

THE PORT OF NEW YORK AUTHORITY
Howard S. Cullman, Chairman
New York, March 27, 1952

Bids: April 14, 1952

Port Newark, Building No. 140

THE PORT OF NEW YORK AUTHORITY
FOUNDATIONS
CONTRACT
PN-200.002

Sealed proposals for the construction of foundations for Building No. 140 at Port Newark will be received at the office of the Chief Engineer of The Port of New York Authority, Room 1100, 111 8th Ave., New York 11, until 11:15 A.M. Monday, April 14, 1952, at which time and place said proposals will be opened and read.

Contract documents may be seen at the office of the Chief Engineer and copies will be furnished upon deposit of $25 per set. The deposit will be remitted if the documents are returned in good condition, not later than 30 days after the opening of proposals.

THE PORT OF NEW YORK AUTHORITY
Howard S. Cullman, Chairman
New York, March 27, 1952

Bids Asked April 22, 1952

Ten Gravel Barrel Wells & Pumping Stations

Sealed bids will be received until 9:00 A.M. EST, April 22nd, A.D., 1952, by the City Commission in the City Commission Chambers at Fort Lauderdale, Florida for "Ten Gravel Barrel Wells and Pumping Stations".

Bidding blanks may be obtained from office of the Engineer. Plans and specifications are on file in the office of the Engineer.

A deposit of $25.00 for plans and specifications, and of $25.00 each for additional copies of plans or specifications, will be required. All deposits for plans and specifications will be refunded upon their return in good condition within ten (10) days of the opening of bids.

A certified check for 2% of the total amount of the bid, made payable to City of Fort Lauderdale, Florida shall accompany each proposal as evidence of good faith and responsibility of the bidder. This check shall be retained by the payee as liquidated damages should the bidder refuse or fail to enter into a contract with the payee for the execution of the work embraced in the proposal, in the event the proposal of the bidder is accepted.

The Owner reserves the right to reject any or all bids.

H. M. LINK
City Engineer

ANNOUNCEMENT

Effective with the April 3, 1952 issue of ENGINEERING NEWS-RECORD, advertising in the OFFICIAL PROPOSAL SECTION will be charged for at the rate of $1.50 per line or fraction thereof per insertion.

OFFICIAL PROPOSALS

Bids: April 2, 1952

Delaware Memorial Bridge

CONTRACT NO. 18
NEW CASTLE INTERCHANGE RAMPS AND TOLL PLAZA MODIFICATION

Sealed proposals for construction of access ramps at New Castle Overpass, the widening of pavement and the extension of parking areas at the toll plaza for "The Delaware Memorial Bridge" over the Delaware River near Wilmington, Delaware will be received by the Delaware State Highway Department at the office of the Director, Delaware Crossing Division, Administration Building, Delaware Memorial Bridge, Wilmington, Delaware, until 12 o'clock noon Eastern Standard Time, April 2, 1952, at which time and place said proposals will be publicly opened and read.

The work involves the following principal quantities:

Selected Permeable Material	5,500 cu.yds.
Select Material	2,800 cu.yds.
Fine Aggregate for Backfill	300 tons
Earth Excavation	20,100 cu.yds.
Cement Concrete Masonry	60 cu.yds.
Cement Concrete Pavement	1,830 cu.yds.
Wire Mesh Reinforcement	640 squares
Waterbound Macadam	1,235 tons
Bituminous Cement Concrete	660 tons
Topsoil	22,500 cu.yds.
8-Inch Perforated Underdrains	1,500 lin. ft.

Work on Contract 18 shall begin promptly after the execution of the Contract. It shall be completed in accordance with the following schedule:

Cement concrete pavement and shoulders in the toll area, August 1, 1952.

Entire Contract, September 1, 1952.

Monthly payments will be made for ninety (90) per cent of the construction completed each month.

Bidders must submit proposals upon forms furnished by the Department.

Each proposal must be accompanied by an acceptable surety bond or certified check for a sum equal to at least ten (10) per cent of the total amount of the proposal.

The Contract will be awarded or proposals rejected within twenty (20) days from the date of opening proposals. The right is reserved to reject any or all bids.

One set of the Plans and two copies of the Specifications may be obtained from the Engineers, Howard, Needles, Tammen & Bergendoff, 55 Liberty Street, New York 5, N. Y. after March 10, 1952 upon payment of $10.00.

Any prospective bidder who has made such a deposit may secure extra blueprint copies of the Plans upon payment of 50 cents per drawing and an extra copy of the Specifications upon payment of $2.50 per copy.

Plans and Specifications need not be returned to the Engineers, and the above payments will not be refunded.

The Plans and Specifications and other contract documents may be examined at the office of the Engineer, Howard, Needles, Tammen & Bergendoff, or at the Engineers' project office located north of and adjacent to the west abutment of the Delaware Memorial Bridge in the State of Delaware.

State Highway Department
by: J. Gordon Smith, Chairman
W. A. McWilliams, Director
Delaware Crossing Division
March 1, 1952

Bids: April 8, 1952

Palisades Interstate Parkway, Secs. 2E & 1C

STATE OF NEW JERSEY
STATE HIGHWAY DEPARTMENT
TRENTON

NOTICE IS HEREBY GIVEN that sealed bids will be received by the State Highway Commissioner for:

Construction of Palisades Interstate Parkway, New Jersey Sections 2E and 1C, from Sta. 166+53 South of Clinton Avenue, to Sta. 319+00 South of Hillside Avenue, Paving, in the Boroughs of Englewood Cliffs, Tenafly and Alpine, Bergen County. Length 3.525 miles. The principal items of construction are:

Estimated:

7,372 cu. yds.	Roadway Excavation—Earth
28,000 cu. yds.	Borrow Excavation
41,267 cu. yds.	Subbase
96,047 sq. yds.	Waterbound Macadam Base Course
84,576 sq. yds.	Waterbound Macadam Intermediate Course
14,600 tons	Bituminous Concrete Surface Courses
36,676 lin. ft.	White Concrete Curbs

Bids for the above will be received at the office of the State Highway Department, Assembly Room, Room 140, in the State Highway Office Building, 1035 Parkway Avenue, Trenton, New Jersey, on Tuesday, April 8, 1952, at eleven o'clock (11:00 A.M.—EASTERN STANDARD TIME), and will be opened and read immediately thereafter.

The receipt and opening of bids is subject to the proper qualification of the bidder in accordance with the provisions of the prequalification law and the regulations adopted by the State Highway Commissioner. Bidders must also submit a revised financial statement and statement of plant and equipment with their bid.

Drawings, specifications and form of bid, contract and bond for the proposed work are on file in the office of the State Highway Department, Trenton, New Jersey, and may be inspected by prospective bidders during office hours. Plans will be furnished on a deposit of Ten Dollars ($10.00) for each set of plans upon application to A. Lee Grover, Chief Clerk, State Highway Department, Room 139, State Highway Office Building, 1035 Parkway Avenue, Trenton, New Jersey. Bids must be made upon the standard proposal forms in the manner designated in the standard State Highway specifications and must be enclosed in sealed special addressed envelopes bearing the name and address of the bidder and work bid upon on the outside, and must be accompanied by a certified check drawn to the order of the Treasurer of the State of New Jersey for not less than ten percent (10%) of the amount of the bid, provided that the said certified check shall not be less than $500.00 nor more than $20,000 and must be delivered at the above place on or before the hour named. Copies of the standard proposal forms and special addressed envelopes will be furnished on application. Bids not enclosed in sealed special addressed envelopes will be considered informal and will not be opened. The right is reserved to reject any or all bids.

Signed: R. J. Abbott
State Highway Commissioner

Bids: April 8, 1952

Route 42, Section 3B

STATE OF NEW JERSEY
STATE HIGHWAY DEPARTMENT
TRENTON

NOTICE IS HEREBY GIVEN that sealed bids will be received by the State Highway Commissioner for:

Construction of Route 42, Section 3B, Channelized Intersection at Route 45 in the City of Camden and Haddon Township, Camden County. Federal Project No. U-384(8). Length 0.389 mile. The principal items of construction are:

Roadway Items

Estimated:

15,233 cu. yds.	Roadway Excavation — Earth
5,000 cu. yds.	Borrow Excavation
7,111 cu. yds.	Wet Excavation
14,183 sq. yds.	Waterbound Macadam Base Course
14,183 sq. yds.	Waterbound Macadam Inter. Course
6,325 tons	Bituminous Concrete Surface Courses
2,659 sq. yds.	8" Plain Concrete Base Course
634 lin. ft.	Reinforced Concrete Pipe
18,907 lin. ft.	Concrete Curbs

Bridge Items

141 cu. yds.	Concrete in Structures
5,900 lbs.	Reinforcement Steel
9 M.B.M.	Timber Flooring & Headers
2,500 lin. ft.	Timber Piles

Bids for the above will be received at the office of the State Highway Department, Assembly Room 140, in the State Highway Office Building, 1035 Parkway Ave., Trenton, N. J., on Tuesday, April 8, 1952, at eleven o'clock (11:00 A.M.—EASTERN STANDARD TIME) and will be opened and read immediately thereafter.

The receipt and opening of bids is subject to the proper qualification of the bidder in accordance with the provisions of the prequalification law and the regulations adopted by the State Highway Commissioner. Bidders must also submit a revised financial statement and statement of plant and equipment with their bid.

NOTE: The proposed project is a "Federal Aid Project" authorized by the provisions of Title 27 of the Revised Statutes of New Jersey and supplements and by P. L. 769, 81st Congress, and is to be performed in accordance with the special provisions and requirements of the Bureau of Public Roads, Department of Commerce, as outlined in the specifications, which provisions require that labor be employed from lists furnished by the State Employment Service, 910 Broadway, Camden, New Jersey. The attention of bidders is directed to the special provisions covering subletting or assigning the contract. The minimum wage paid to all common labor employed on this contract shall be $.75 per hour. The minimum wage paid to all intermediate grade of labor employed on this contract shall be $1.00 per hour. The minimum wage paid to all skilled labor employed on this contract shall be $1.50 per hour.

Drawings, specifications and form of bid, contract and bond for the proposed work are on file in the office of the State Highway Department, Trenton, New Jersey, and may be inspected by prospective bidders during office hours. Plans will be furnished on a deposit of Ten Dollars ($10.00) for each set of plans upon application to A. Lee Grover, Chief Clerk, State Highway Department, Room 139, State Highway Office Building, 1035 Parkway Avenue, Trenton, N. J. Bids must be made upon the standard proposal forms in the manner designated in the standard State Highway specifications and must be enclosed in sealed special addressed envelopes bearing the name and address of the bidder and work bid upon on the outside, and must be accompanied by a certified check drawn to the order of the Treasurer of the State of New Jersey for not less than ten percent (10%) of the amount of the bid, provided that the said certified check shall not be less than $500.00 nor more than $20,000.00 and must be delivered at the above place on or before the hour named. Copies of the standard proposal forms and special addressed envelopes will be furnished on application. Bids not enclosed in sealed special addressed envelopes will be considered informal and will not be opened. The right is reserved to reject any or all bids.

Signed: R. J. Abbott
State Highway Commissioner

Bids: April 14, 1952

Port Authority Building

THE PORT OF NEW YORK AUTHORITY
ALTERATIONS IN ROOMS 1526, 1100, 1006 AND 1001
CONTRACT EXD-120.052

Sealed proposals for performing alterations in Rooms 1526, 1100, 1006 and 1001 will be received at the office of the Chief Engineer of The Port of New York Authority, Room 1100, 111 8th Ave., New York 11, until 11:00 A.M. Monday, April 14, 1952, at which time and place said proposals will be opened and read.

Contract documents may be seen at the office of the Chief Engineer and copies will be furnished upon deposit of $25 per set. The deposit will be remitted if the documents are returned in good condition, not later than 30 days after the opening of proposals.

THE PORT OF NEW YORK AUTHORITY
Howard S. Cullman, Chairman
New York, March 27, 1952

U. S. Government

DEPARTMENT OF THE INTERIOR, Bureau of Reclamation. Sealed bids (Invitation No. DS-3697) will be received at Denver, Colorado, until May 1, 1952, for furnishing two vertical shaft, 9,400 horsepower, 150 rpm hydraulic turbines for Nimbus Power Plant, Central Valley Project, California. Delivery is desired within 720 days. For particulars Bureau of Reclamation, Building 53, Denver Federal Center, Denver, Colorado.

Department of Commerce, Bureau of Public Roads, March 13, 1952. SEALED BIDS will be received at the office of the Division Engineer, Bureau of Public Roads, 1440 Columbia Pike, Arlington, Virginia, until 11:00 a.m., E.S.T., April 10, 1952 for the construction of Project 1A3, National Capital Parks, District of Columbia. Widening of Constitution Avenue from Virginia Avenue to 26th Street. Length 0.745 mile. The approximate quantities of the more important items are: 2,700 sq.yd. Reinforced Cement Concrete Base Course, 2,800 tons Type I-1 Hot Asphalt Concrete Pavement, 1,250 cu.yd. Gravel Base Course, 3,825 lin.ft. Concrete Curb and 2,100 sq.yd. Concrete Sidewalk. Minimum wage rates have been fixed as required by law. Plans, specifications and proposal forms are available upon request at the address given above. H. J. Spelman, Division Engineer.

OFFICIAL PROPOSALS

Bids: April 7, 1952

Steel Tank and Tower

Sealed bids will be received until 11:00 A.M., E.S.T., April 7, A.D., 1952, in the office of the Town Clerk, Lauderdale-By-The-Sea, Florida for ELEVATED STEEL TANK AND TOWER—250,000G.

Plans, specifications and bidding blanks may be obtained from the office of the Town Clerk.

A deposit of $25.00 for plans and specifications and of $15.00 each for additional copies of plans or specifications will be required. All deposits for plans and specifications will be refunded upon their return in good condition within ten (10) days of the opening of bids.

A certified check or cashier's check for 2% of the total amount of the bid, made payable to Town of Lauderdale-By-The-Sea, Florida shall accompany each proposal as evidence of good faith and responsibility of the bidder. This check shall be retained by the payee as liquidated damages should the bidder refuse or fail to enter into a contract with the payee for the execution of the work embraced in the proposal, in the event the proposal of the bidder is accepted.

Any bid accepted by the Owner shall be subject to the Owner's ability to validate and sell indentures or certificates in an amount sufficient to cover the overall cost of the water system in the Town of Lauderdale-By-The-Sea, Florida.

The Owner reserves the right to reject any or all bids.

CAROLE GARLAND
Town Clerk

Bids: April 2, 1952

Contract No. 20 — Maintenance Building and Additional Toll Plaza Facilities

THE DELAWARE MEMORIAL BRIDGE

Sealed proposals for construction of Maintenance Building and Additional Toll Plaza Facilities for "The Delaware Memorial Bridge" over the Delaware River near Wilmington, Delaware, will be received by the Delaware State Highway Department, at the office of the Director, Delaware Crossing Division, Administration Building, Delaware Memorial Bridge, Delaware, until 12 o'clock noon, Eastern Standard Time, April 2, 1952, at which time and place said proposals will be publicly opened and read.

The entire work involves the following:

(a) Construction of a one-story maintenance building approximately 113 by 107 feet overall, including relocation of existing gas tank and pump; automotive lift; lubrication equipment; sand storage hopper; plumbing, lighting, heating and air conditioning facilities; and other work incidental thereto.

(b) Reconstruction at Toll Plaza, including the reconstruction and extension of utility tunnel; construction of two 16 by 46-foot reinforced concrete roadway slabs; including excavation preparation of subgrade and construction of subbase; construction of two reinforced concrete toll booth islands; installation of roadway treadle frames and curb boxes; and other work incidental thereto.

(c) Construction of two metal and glass toll booths, with connecting metal canopy.

(d) Furnishing and installing toll collection and registering equipment.

(e) Furnishing and installing roadway treadle and counters.

Work on this Contract shall begin promptly after execution of the Contract. It shall be completed in accordance with the following schedule:

Work under item (b) above..July 1, 1952
Work under items (c), (d), and (e) above .....August 1, 1952
Entire Contract .....October 1, 1952

Monthly payments will be made for ninety (90) per cent of the construction completed each month.

Bidders must submit proposals upon forms provided by the Department.

Each proposal must be accompanied by an acceptable surety bond or certified check to the amount of at least ten (10) per cent of the total amount of the proposal.

The Contract will be awarded or proposals rejected within twenty (20) days from the date of opening proposals. The right is reserved to reject any or all bids.

One set of the Plans and two copies of the Specifications may be obtained from the Engineers, Howard, Needles, Tammen & Bergendoff, 55 Liberty Street, New York 5, New York, after March 12, 1952, upon payment of $10.00.

Any prospective bidder who has made such a deposit may secure extra blueprint copies of the Plans upon payment of 50 cents per drawing and an extra copy of the Specifications upon payment of $2.50 per copy.

Plans and Specifications need not be returned to the Engineers, and the above payments will not be refunded.

The Plans and Specifications and other contract documents may be examined at the office of the Engineer, Howard, Needles, Tammen & Bergendoff, or at the Engineers' project office located north of and adjacent to the west abutment of the Delaware Memorial Bridge in the State of Delaware.

State Highway Department
by: J. Gordon Smith, Chairman
W. A. McWilliams, Director
Delaware Crossing Division
March 3, 1952

Bids: April 7, 1952

Water Mains

Sealed bids will be received until 11:00 A.M., E.S.T., April 7, A.D., 1952, in the office of the Town Clerk, Lauderdale-By-The-Sea, Florida for WATER MAINS.

Plans, specifications and bidding blanks may be obtained from the office of the Town Clerk.

A deposit of $25.00 for plans and specifications and of $15.00 each for additional copies of plans or specifications will be required. All deposits for plans and specifications will be refunded upon their return in good condition within ten (10 days of the opening of bids.

A certified check or cashier's check for 2% of the total amount of the bid, made payable to Town of Lauderdale-By-The-Sea, Florida shall accompany each proposal as evidence of good faith and responsibility of the bidder. This check shall be retained by the payee as liquidated damages should the bidder refuse or fail to enter into a contract with the payee for the execution of the work embraced in the proposal, in the event the proposal of the bidder is accepted.

Any bid accepted by the Owner shall be subject to the Owner's ability to validate and sell indentures or certificates in an amount sufficient to cover the overall cost of the water system in the Town of Lauderdale-By-The-Sea, Florida.

The Owner reserves the right to reject any or all bids.

CAROLE GARLAND
Town Clerk

Bids: April 16, 1952

Construction Project, New Jersey

Notice is hereby given that sealed proposals will be received by the State of New Jersey for work in connection with a construction project encompassing a Medical-Surgical-Reception Building; a Laundry Building; a Kitchen-Dining Building; a Boiler House; Connecting Tunnels and Miscellaneous Buildings for the Fourth Mental Hospital for the State of New Jersey at Winslow Township, Camden County, New Jersey.

Bids will be received in the office of the Director, Division of Purchase & Property, Room 318, State House, Trenton 7, New Jersey between the hours of 1 P.M. and 2 P.M. Eastern Standard Time on Wednesday, April 16, 1952, and will be opened and read in public immediately thereafter. No bid received after 2 P.M. will be accepted.

Separate bids will be received for:

General Construction Work
Structural Steel & Miscellaneous Iron Work
Plumbing Work
Potable Water & Fire Protection Lines
Heating, Ventilating & Air Conditioning Work
Electrical Work
Electric Passenger Elevators
Hydraulic Freight Elevator
Food Service Equipment
Laundry Machinery & Equipment
Storm & Site Drainage Work

Bids must be made on prepared "Form of Proposal" and must be accompanied by a certified check drawn to the order of the Treasurer of the State of New Jersey for not less than five (5) per cent of the total base bid or by a bid bond in like amount.

Bids not submitted on prepared "Form of Proposal" sheets or enclosed in other than specially addressed envelopes will be considered informal and will be rejected.

Form of Proposal, Instructions to Bidders, Contract Documents, Drawings and Specifications may be examined at offices of the Architect, Epple & Seaman and Leslie M. Dennis, Associate Architect, 901 Broad Street, Newark, New Jersey or at the office of the Director, Division of Purchase & Property, State House, Trenton, New Jersey.

The Director reserves the unrestricted right to accept or reject any or all bids or to waive informalities therein.

The successful bidders will be required to qualify for surety bond in full amount of contracts, of a company authorized to do business in the State of New Jersey.

No bid shall be withdrawn for a period of two (2) calendar months subsequent to opening of bids, without the consent of the State of New Jersey.

One set of complete documents for the proposed work may be obtained upon application to the Architect on deposit of a certified check in the amount of $100.00 drawn to the order of the Treasurer of the State of New Jersey. This deposit will be refunded to any bidder upon returning such set in good condition within ten (10) days after opening bids.

Additional sets of plans and specifications may be obtained from the Architect on deposit of a certified check in the amount of $62.80 drawn to the order of the Treasurer of the State of New Jersey. This amount will not be refunded.

A financial and Experience Questionnaire must be submitted to the Director of the Division of Purchase and Property, prior to submission of bids.

DEPARTMENT OF THE TREASURY
Division of Purchase and Property
Fred V. Ferber, Director

Bids: April 2, 1952

Soil Explorations—Spec. SM-34

STATE DEPARTMENT OF PUBLIC WORKS, ALBANY, N. Y.—Pursuant to the provisions of Highway Law, sealed proposals will be received until 10:30 A.M., Eastern Standard Time, on April 2, 1952 by Henry A. Cohen, Director, Bureau of Contracts and Accounts, 14th Floor, The Governor Alfred E. Smith State Office Building, Albany, N. Y., for

SOIL EXPLORATIONS AND FOUNDATION INVESTIGATIONS AT VARIOUS SITES ON THE NEW YORK STATE THRUWAY, CATSKILL SECTION, SUBDIVISION NOS. 6 AND 7, RAVENA TO ROUTE 23A, GREENE COUNTY, SUBDIVISION 3A, DELAWARE AVENUE TO SOUTHERN BLVD., ALBANY COUNTY; WHICH CONSTITUTES CONTRACT NO. SPEC. SM-34

Maps, plans and specifications may be examined and obtained at the following offices:

(a) Bureau of Contracts and Accounts, 14th Floor, The Governor Alfred E. Smith State Office Building, Albany 1, N. Y.

(b) G. L. Nickerson, District Engineer, 353 Broadway, Albany 1, N. Y.

(c) Charles Schaefer, Department of Public Works, 270 Broadway, New York City.

The deposit for a set of plans, specifications and proposal forms is $5.00. A refund in full will be made to bidders for return of one set in good condition within 30 days of award or rejection of bids; refund for all other sets in good condition, similar period, will be 50% of deposit.

The Engineer's estimate of cost for this work is $27,525.00.

Proposal for this contract must be submitted in a separate sealed envelope with the name of the contract plainly endorsed on the outside of the envelope. Proposal must be accompanied by draft or certified check, payable to the order of the "State of New York, Commissioner of Taxation and Finance" for the sum of $1,377.00. The retention and disposal of the bidding check, the execution of the contract and bonds shall conform to the provisions of the Highway Law, as set forth in "Instruction to Bidders".

The right is reserved to reject any or all bids.

B. D. TALLAMY
Superintendent of Public Works

U. S. Government

BIDS FOR PATROL BOAT—Memphis District Corps of Engineers, U. S. Army, P.O. Box 97, Memphis 1, Tenn. Sealed bids will be received here until 11:00 a.m., C.S.T., April 22, 1952, and then publicly opened for construction of a steel, Diesel, twin-screw, 115-foot patrol boat. $10.00 deposit required on plans. Information on request.

CLASSIFIED **SEARCHLIGHT SECTION** ADVERTISING

EMPLOYMENT • BUSINESS • **OPPORTUNITIES** • EQUIPMENT—USED or RESALE

UNDISPLAYED RATE:
(Not available for equipment advertising)
$1.50 cents a line, minimum 3 lines. To figure advance payment count 5 average words as a line.
POSITION WANTED & INDIVIDUAL SELLING OPPORTUNITY undisplayed advertising rate is one-half of above rate, payable in advance.
PROPOSALS, $1.25 a line an insertion.

INFORMATION.
BOX NUMBERS count as 1 line additional in undisplayed ads.
DISCOUNT OF 10% if full payment is made in advance for four consecutive insertions of undisplayed ads (not including proposals).
EQUIPMENT WANTED or FOR SALE Advertisements acceptable only in Displayed Style.

DISPLAYED—RATE PER INCH:
The advertising rate is $14.25 per inch for all advertising appearing on other than a contract basis. Contract rates quoted on request.
AN ADVERTISING INCH is measured ⅞ inch vertically on one column, 3 columns—30 inches —to a page. E.N.R.

NEW ADVERTISEMENTS Address New York Office, 330 W. 42nd St., N. Y. 36, for April 10th issue closing March 31st

Wanted
ENGINEER-LEGAL

Industrial corporation seeks C.E. or M.E. with legal and heavy industrial construction background for executive position in corporation engaged in essential industry past 25 years.

Outstanding opportunity for aggressive, experienced man to stay with top management covering many and varied work projects.

Generous salary and permanent position. Replies confidential.

P-3705, Engineering News-Record
330 W. 42nd St., New York 36, N. Y.

WANTED
Sanitary Engineer

Age 30 to 40 years. Experienced in treatment of industrial plant wastes. Accustomed to client and public relations.

Please forward qualifications, experience, and date available to:

GIBBS & HILL
Inc.
PENNSYLVANIA STATION
NEW YORK 1, N. Y.

WANTED
OIL HEATING ENGINEER
(Assistant Shop Superintendent)

MANUFACTURER OFFERS PERMANENT POSITION TO MAN WITH 15 YEARS OR MORE EXPERIENCE IN IMPROVING PERFORMANCE, DESIGN AND SUPERVISING INSTALLATION OF ALL TYPES OF AUTOMATIC HEATING PLANTS FOR HOMES, APARTMENTS AND COMMERCIAL BUILDINGS.

P-3706, Engineering News-Record
330 W. 42nd St., New York 36, N. Y.

ASSISTANT UTILITIES ENGINEER

Career positions with California Public Utilities Commission. Requirements: Degree and two years with utility or allied industry. (Some substitution in qualifications allowable.) Interviews in California only. Write for full information on salary, opportunities, benefits, etc., to **State Personnel Board, Dept. NR, 1015 L Street, Sacramento, California.**

REPLIES (Box No.): Address to office nearest you
NEW YORK: 330 W. 42nd St. (36)
CHICAGO: 520 N. Michigan Ave. (11)
SAN FRANCISCO: 68 Post St. (4)

POSITIONS VACANT

BRIDGE DESIGNERS and Draftsmen. Good pay for qualified men. Opportunities for advancement. Pleasant working conditions. Interesting projects. Apply in person or write fully stating education and experience. D. B. Steinman, Consulting Engineer, 117 Liberty Street, New York 6, N. Y.

CHIEF ESTIMATOR for an active contracting firm specializing in heavy construction in Metropolitan New York. Must be familiar with excavation, foundations, bridges, highways, etc. Good financial opportunity. State education, experience and particulars to P-3688, Engineering News-Record.

CPA—THOROUGHLY familiar with construction accounting; steady, top salary for top man. Newark, New Jersey Territory. P-3547, Engineering News-Record.

DRAFTSMEN, EXPERIENCED, Structural Steel Checkers and Detailers; Ornamental and Miscellaneous Detailers. State experience and list references in letter to: Southern Engineering Company, Charlotte, North Carolina.

EXPERIENCED ESTIMATOR and Superintendent for "Gunite" Restoration and High Pressure Grouting. P-3326, Engineering News-Record.

EXPERIENCED ROAD & Utilities Engineer. Excellent working conditions, permanent work, and excellent pay. State qualifications and experience in a letter in full detail and mail to: Mr. R. E. Donnellan, 174 Corona Street, Springfield, Mass.

QUALIFIED EXPERIENCED building estimator, capable of quantity takeoff and pricing. Location Fort Lauderdale, Florida. Write full particulars to Caldwell-Scott Engineering & Construction Co., Inc. Post Office Box 1221, Fort Lauderdale, Florida.

TOWN IN Southern New England, population 40,000, seeks qualified Engineer to take complete charge of administration and operation of new Sewage Treatment Plant. Should have C E Degree with sanitary major or its equivalent and at least five (5) years experience in sewage plant operation. Send brief resume of education and experience. Selected candidates will receive interviews. Salary open. East Providence Sewer Commission, Town Hall, East Providence, R. I.

WANTED: BRIDGE Designers with office and field experience by consulting engineering firm in Pennsylvania. Give complete details and salary desired. P-3662, Engineering News-Record.

WANTED—COMPUTOR-Draftsman to work in a Surveyors office. Communicate by phone—Freeport 8-6760 any time between 8 & 5 o'clock. Baldwin & Cornelius Co., Freeport, N. Y.

WANTED: CONSTRUCTION Superintendent for heavy construction including dams, bridges and public works in Southeast. Prefer engineering graduate with 10 to 20 years experience. Must know equipment, be competent to handle men and organize work. Write giving experience, qualifications and salary expected. P-3682, Engineering News-Record.

SALARIED POSITIONS $3,500—$35,000
We offer the original personal employment service (established 42 years.) Procedure of highest ethical standards is individualized to your personal requirements. Identity covered; present position protected. Ask for particulars.
R. W. BIXBY, Inc., 272 Dun Bldg., Buffalo 2, N. Y.

SELLING OPPORTUNITY OFFERED

CIVIL ENGINEER with sales experience has good opportunity in Pittsburgh territory with large manufacturer in construction field. Must have C.E. degree. Should have experienced contacting engineers and contractors. State qualifications in first letter. SW-3625, Engineering News-Record.

EMPLOYMENT SERVICE

ENGINEERS NEEDED in all fields at all levels. Salaries commensurate with experience & ability. Highly confidential service. Bring or mail 3 resumes to: Position Securing Bureau Inc. (Agency), 45 John St., N. Y. 38, N. Y.

POSITIONS WANTED

ACCOUNTING EXECUTIVE, seeks key accounting position with general contractor. 22 years experience in all phases of construction accounting and office management in Main Office and Field. Prefer permanent location. Good clean record. PW-3644, Engineering News-Record.

ASSISTANT TO Contractor, 25 years experience in field and office as superintendent, engineer, and estimator on buildings, roads and general construction. Available now. Prefer New England. PW-3691, Engineering News-Record.

CHIEF ENGINEER—Structural and Architectural, 25 years experience on industrial buildings, power plants, etc. PW-3591, Engineering News-Record.

CIVIL ENGINEER, age 26, married, registered, 4 yrs. structural design, 2 yrs. heavy construction, desires aggressive position with consulting engineer. PW-3725, Engineering News-Record.

CIVIL ENGINEER, Broad field and office experience, supervision and engineering on heavy construction, airports, highways, subdivisions, drainage, sewers, water mains, municipal and defense projects. Panama Third Locks Project, ex. "SeaBee" construction officer. Eighteen years responsible assignments, stateside and abroad. Seeking permanent connection in United States. Age 42, Registered P.E. Penna. PW-3692, Engineering News-Record.

CIVIL ENGINEER: Graduate with Masters Degree, Member A.S.C.E., Member N.S.P.E. Registered Professional Engineer: Ohio, New York, Maryland, Michigan. Twenty years experience in preliminary surveys, soil surveys, foundation investigations, location, design, construction and maintenance of highways, bridges, airports, dams, industrial and commercial buildings. Six years foreign service in England, Africa, Italy, Greece, Ceylon and Turkey. Available May 1st. Foreign or Domestic. PW-3659, Engineering News-Record.

CIVIL ENGINEER, M.ASCE, 56, degrees, state licenses, 30 years experience; design, construction, and administration; bridges, parkways, thruways, airports, harbor works, railroads, underpinning and foundations. PW-3736, Engineering News-Record.

PROJECT MANAGER, 38, graduate engineer. Thorough knowledge of N. Y. building area. Experienced in estimating, subcontracts, superintendency, etc. Desire opportunity with growing company. PW-3597, Engineering News-Record.

(Continued on page 142)

WANTED
ENGINEERS
CIVIL or MECHANICAL

Opportunity for permanent staff positions with old, established industrial organization on Eastern Seaboard—headquarters—N. Y. C.

Experience various types industrial, commercial, pipe, refinery or other liquid storage type of construction. Consider man with 7 years experience upwards.

Generous starting salaries, several openings, not project jobs. Replies confidential.

P-3710, Engineering News-Record
330 W. 42nd St., New York 36, N. Y.

ENGINEERS
DESIGNERS & DRAFTMEN
Electrical, Mechanical
Structural & Hydraulic

Reinforced Concrete
Designers & Detailers

FOR WORK ON

Industrial Plants
Paper & Textile Mills
Water Supply & Waste Disposal
Steam & Hydroelectric Power Plants
Electrical Transmission & Distribution

CHAS. T. MAIN, Inc.

80 Federal Street, Boston 10, Mass.
317 South Tryon St., Charlotte, N. C.

WANTED
MECHANICAL ENGINEER

Established consulting firm, New York area, desires Mechanical Engineer, capable supervising starting, testing, operating and correcting troubles of steam-electric station equipment. Plant betterment work involving considerable travelling. Technical education, and plant operating or betterment experience required. State education, experience and salary desired.

P-3630, Engineering News-Record
330 W. 42nd St., New York 36, N. Y.

WANTED
COST ENGINEER

Experienced construction Cost Engineer needed for work on large steam-electric station construction projects. Location . . . south or southwest. Submit resume of experience, education and salary desired.

Box P-3629, Engineering News-Record
330 W. 42nd St., New York 36, N. Y.

DESIGNERS

Our Liberal *Profit-Sharing Bonus* in 1951 amounted to more than a half million dollars.

We need the following type of men experienced in any phase of Blast Furnace, Steel Mill and Oil Refinery Design:

Structural Designers
Concrete Designers
Electrical Designers
Piping Designers
Checkers

Positions available in our offices at Cleveland, Ohio, Union, New Jersey and Tulsa, Oklahoma.

WRITE

ARTHUR G. McKEE & CO.
2300 Chester Ave., Cleveland 1, Ohio

Permanent Positions Open to
ENGINEERS

. . . after training at full-time pay . . . as

Consultants in
Fire Protection Engineering

to top U. S. and Canadian industry. Usual pension and other benefits. Excellent opportunities; fast-growing engineering organization.

Write complete qualifications to:
P-2807, Engineering News-Record
330 W. 42 St., New York 36, N. Y.

WANTED
CITY ADMINISTRATOR

City of San Carlos, Calif.
(Pop. approx. 16,000) invites applications

Salary open depending upon the experience and qualifications of man selected. City Administrator experience preferred. Contact City Clerk, City Hall, San Carlos, California, for application and qualifications. Closing date for receipt of applications closes May 31st.

ENGINEERS - INSPECTORS
CHEMISTS - GEOLOGISTS
Field and Laboratory

Experienced in Plant and Site Inspection of Concrete and Asphalt. Compaction control of Earth Fill. Foundation Drilling & Soil Tests.

DOMESTIC AND FOREIGN ASSIGNMENTS
Write in Complete Detail to

TOLEDO TESTING LABORATORY
TOLEDO, OHIO

WANTED
ENGINEER SPECIALIZED
IN FLOOD CONTROL, IRRIGATION

Consulting Engineering Firm in Caracas, Venezuela, requires an experienced Civil Engineer with ample experience to take charge of design of flood control, irrigation and drainage for large zone south of Lake Maracaibo.

Work in Caracas Office and trips to field.

Contract one year plus extension six months.

Send complete information including age, marital status, education, detailed experience resume, references and salary desired.

APARTADO 1404, CARACAS, VENEZUELA

ENGINEERS

for design and construction of several major municipal projects. Starting Salaries: $3707, $4515, $5334, $6143, $7036 per year. Write

DETROIT CIVIL SERVICE COMMISSION
735 Randolph St., Detroit 26, Mich.

STRUCTURAL ENGINEERING
ARCHITECTURAL ENGINEERING
OUR COURSES of instruction by mail HAVE HELPED THOUSANDS to better positions and to pass State Board Examinations. Forty-first year. Write today.
WILSON Engineering Corp.
College House Offices - HARVARD SQUARE, CAMBRIDGE, MASS.

CONTRACTOR'S BUSINESS FOR SALE
Owner retiring, Central New York State
Land, large garage & separate modern office building. Equipment includes all types of equipment and tools for water, sewer and excavation work. Could include our personnel if desired.
BO-3574, Engineering News-Record
330 W. 42 St., New York 36, N. Y.

POSITIONS WANTED

CIVIL ENGINEER, Canadian, 27, P.Eng. Ont. B.A.Sc. seeks foreign employment in construction. Experienced in surveying, heavy construction, also design, detailing, estimating, erection of steel structures, plant layout, reinforced concrete and timber design. Married, available Sept. 52. PW-3561, Engineering News-Record.

CIVIL ENGINEER: Grad. 1 yr. office experience in structural, piping and heat. and vent. Desires field work. Willing to go abroad. PW-3658, Engineering News-Record.

CIVIL ENGR. Prof. license. Age 42. 16 yrs. exp. on design and const. of Ind'l. and Arch'tl. bldgs. Available soon. Prefer Boston area. PW-3687, Engineering News-Record.

CONSTRUCTION ENGINEER. Graduate Civil, 28, 4 years office and field experience on Heavy Industrial Buildings, Foundations and Drainage Structures, Highways, and large earth moving projects. Desires foreign location where family can accompany. PW-3679, Engineering News-Record.

GRADUATE CIVIL Engineer (34), married. Excellent background on all types construction projects (some foreign), wishes to locate with large Contracting, Industrial or oil concern on home or foreign contract. PW-3728, Engineering News-Record.

POSITIONS WANTED

CONSTRUCTION IN Europe. Available for top executive-supervisory-technical position only. 30 years experience as Civil Engineer including 3 years in top civilian supervisory capacities in U. S. Army Engineers Command in Germany. Most recent experience 2½ years in responsible position in U. S. Air Force construction program in Europe. Speak French and German. PW-3702, Engineering News-Record.

EXECUTIVE CONSTRUCTION Engineer, long experience, estimates and supervision heavy construction including foundations, dams, docks, tunnels, especially difficult subaqueous structures. PW-3497, Engineering News-Record.

FIELD ACCOUNTANT, office manager. Full charge accounting and office administration. Travel domestic or to foreign countries. Frank Imperiale, Hotel Capitol, N.Y.C., N.Y.

COST ENGINEER: Employed—Specializing job costs developing unit prices for use in estimating. Skilled accountant — possess the "Know-How" to operate economically and profitably. Seeking greater opportunity—permanent employment—Married—middle aged. College trained. PW-3668, Engineering News-Record.

POSITIONS WANTED

LICENSED CONTRACTOR. Specializing in Commercial building for past four years, graduate C.E. Age 33, married. Registered professional engineer. Qualified estimator. Business management. Field supervisor, costs, purchasing, contracts. World War II pilot. Desires position with large organization, domestic or foreign, with opportunity for advancement. Available immediately. Correspondence invited. PW-3663, Engineering News-Record.

STRUCTURAL ENGINEER, B.Sc. in civil eng. and M.S. in structural eng. and foundations from a well recognized university. Three years experience in design and construction of buildings, bridges and power plants. Single, age 27, desires a position in N.Y. City. At present employed outside N.Y. State. PW-3657, Engineering News-Record.

SELLING OPPORTUNITY WANTED

SALES ENGINEER—thirty years old, graduated with mechanical engineering degree, licensed structural engineer with five years' experience in selling building materials, interested in technical sales field. SA-3724, Engineering News-Record.

SURVEYING INSTRUMENTS
USED • REBUILT • SALE • RENT • REPAIRING

INSTRUMENT REPAIR BY CRAFTSMEN

Our craftsmen have a completely equipped department fully able to accommodate the repair of all makes of transits, levels and measuring tape. Work includes thorough overhaul, cleaning, oiling and adjustment.
Precision work guaranteed.
DAVID WHITE COMPANY
317 W. Court St., Milwaukee 12, Wis.

INSTRUMENTS FOR RENT
We rent transits and levels on a monthly or yearly basis. Reasonable rates. All instruments are fully guaranteed in first class working order.
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FROM STOCK
Brand New & Rebuilt
TRANSITS & LEVELS
Fully equipped modern shop—all makes and models repaired — all work guaranteed — instruments rented
Midwest Representative: W. & L. E. Gurley
NATIONAL BLUE PRINT CO.
Established 1914.
210 S. Canal St. Chicago (6), Ill.

TRANSITS AND LEVELS

New or Rebuilt Sale or Rent
Headquarters for REPAIRS — any make — Factory Service. We will also buy your old instruments or take them in trade.
A complete line of Engineering Instruments and Equipment for field or office. Write for catalog N.R. 1-03.
WARREN-KNIGHT CO.
Manufacturers of Sterling Transits and Levels
136 No. 12th St., Philadelphia 7, Penna.

RE-BUILT REPAIR RENT REAL EXPERTS BUFF ALL MAKES

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SPECIALIZED REBUILDING
of surveying and engineering instruments
All makes and models expertly repaired in modern shop. All work guaranteed
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for sale or rent
ROY D. HICKERSON
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FOR SALE
Caterpillar Tractor Model D6, 9U series, has about 2500 hours, with Hydraulic Angledozer and D6N Winch, electric starting, only 4½ years old, excellent condition. Priced for quick sale.
"TRY US FIRST, FOR GOOD, DEPENDABLE EQUIPMENT, AT THE RIGHT PRICE."
WANTED—IMMEDIATELY
Complete Angledozer Blade attachment for International TD-18A Tractor, must be cable controlled, can also use hydraulic attachment, must be in good condition and priced right.
Phone, Write or Wire
NATIONAL MACHINERY CO.
P. O. Box 2305
Norfolk, 1, Va. Phone: Norfolk 43865

FOR SALE
PLATE GIRDERS
48"-54"-66"—50 Ft. Long
BEAVER CONCRETE BREAKING CO.
233 Broadway, N.Y.C. DI. 9-2864

WANTED

WANTED
Used Heavy Duty Rapid Pavement Breaker
Please give full detail first letter as to Truck, Compressor, and Breaking End.
W-3648, Engineering News-Record
330 W. 42nd St., New York 36, N. Y.

WANTED
1½ yd. Backhoe for Lorain or Osgood
Frank Swabb Equipment Co., Inc.
313 Hazleton Nat'l Bank Bldg.
Hazleton, Pa. Telephone 4910

L. B. SMITH INC. OFFERS

AIR COMPRESSORS

Gardner-Denver 500 cu. ft. diesel, new condition.
Gardner-Denver 365 cu. ft. Diesel Rebuilt.
Gardner-Denver 160 cubic foot gas powered compressor on 4 steel wheels.
Ingersoll-Rand 105 cubic foot, Waukesha gasoline power, on two rubber tires.
Schramm 105 cubic foot gas powered compressor on 4 steel wheels.
Pennsylvania 12" x 10" class 3A single cylinder, 355 cubic foot P.D., flat belt driven 50 HP slip ring motor.
Worthington two-stage, water-cooled, vertical 250#, 60 CFM, new condition.
Paving breakers, jackhammers, wagon drills, tie tampers.

QUARRY EQUIPMENT & BINS

4024 Cedarapids roll, rebuilt.
Symons 3' short head.
Cedarapids Rock-It plant with 2025 jaw, 3033 mill.
Cedarapids 1236 Model 6C plant, new.
3033 Cedarapids Hammermill, rebuilt.
10x7 Allis-Chalmers Blake type jaw crusher.
42" x 10' apron feeder, rebuilt.
#1 Cedarapids Kubit impact breaker.
4' x 6' Kennedy Van Saun single deck.
3' x 12' Simplicity 3 deck, rebuilt.
3' x 6' Kennedy Van Saun triple deck.
3' x 10' Symons double deck.
2—15 cu. yd. Cedarapids sand drags, new.
16" x 90' bucket elevator.
60-ton, 2-compartment, 8'x18' storage bin with clamshell gates.
100-ton, 2-compartment, 13'x23' storage bin with clamshell gates.
Special bins to your specifications.
Conveyors—18"—24"—30"—36". Also belt.

TRUCKS—TRAILERS

31FD Euclid rear dump.
1½-ton Ford with any body.
2½-ton GMC, rebuilt.
2000-gallon tanks on semi-trailer mounting.
New and rebuilt dump bodies.
2,000 gallon tanks on semi-trailer mounting.

GENERATORS & LIGHT PLANTS

1½ KW to 125 KW, alternating and direct current gasoline and diesel powered.

SHOVELS—CRANES

Lorain L-50, 1-yd. diesel. New condition.
Lorain L-41 diesel powered ¾-yd. shovel, rebuilt.
Link-Belt LS50 gas ½-yd. shovel & hoe.
Lorain 30 gas ½-yd. shovel, hoe, crane.
P&H 150 gas crane.
Brownhoist 1-yd. gas shovel & crane.

SHOVEL & CRANE ATTACHMENTS

Lorain TL-20 shovel attachment.
Lorain 41 Chain Crowd Shovel Attachment. Complete.
Lorain 40 Hi-Lift shovel attachment.
P&H 203 shovel attachment.
Chain crowd Lorain 30A shovel attachment.
Bucyrus-Erie 1½-yd. rock bucket.
Lorain 80-820 fairleads.

Backhoe Buckets & Attachments

Lorain TL-25 hoe attachment, new.
Lorain 30 hoe attachment complete.
¾-yd. Lorain, 40, LBS #6105, 44" cutting width.
26" outside width solid bottom type LBS #4377, good condition.
¾-yd. Amsco 40" cutting width, LBS #8101.

CLAM—DRAG—SCRAPER BUCKETS

NEW TAGLINES

McCaffrey Model 648 for 1¼ to 2-yd. crane.
McCaffrey Model 636 for ¾-yd. to 1-yd. crane.

SHOVEL DIPPERS

Lorain 41, ¾-yd. LBS #8600, rebuilt.
New Lima 1-yd. Amsco, LBS #2295.
Bucyrus-Erie 1¼-yd. gas air, LBS #3782, fair.
Lorain 75B, 1½-yd. manganese bucket, LBS #8538.
Lorain 75B, 1¼-yd. extended lip, 1¾-yd. LBS #2260.
Pettibone-Mulliken 2-yd. Lorain 82 or 820, manganese, LBS #5361.
Pettibone-Mulliken 2-yd. for 3500 Manitowoc LBS #5763.
Esco 2½-yd. cast weld dipper with bail & teeth.

CONCRETE ROAD BUILDING & MISCELLANEOUS CONCRETE HANDLING EQUIPMENT

Concrete Equipment

Jaeger type "L" double screed finisher, 10½'-12½', rebuilt.
Heltzel 10'-12' finisher, rebuilt.
Blaw-Knox gas-electric finisher, 10½'-12½', rebuilt.
2 Koehring 10'-12' finishers, rebuilt.
1220'—Heltzel 9"x8" road forms with stakes.
R.B. Fine Grader for 21' width, rebuilt.
Cleveland formgrader, new 1944, rebuilt.
Corr formgrader, new 1944, rebuilt.

TRACTORS

1—Ford Dearborn rubber tired with hyd. front end loader and hoe attachment.
1—Terratrac with front end shovel loader.
1—Terratrac with angledozer blade.

WELL DRILLS & TOOLS

Keystone 50" well drill. Good.
Sanderson-Cyclone #42 well drill, new.
Sanderson-Cyclone #44 well drill, new.
Bits—Stems—Bailers—Sockets—Etc.

PUMPS

New Layne Bowler type 18 deep well pump with right angle gear drive. 3000 GPM at 120' TDH.
Used and rebuilt pumps, all sizes, gasoline, electric or diesel.

GRADERS

Austin Western 77 tandem drive, scarifier, 12' blade, gas power, hydraulic controls.

GASOLINE AND DIESEL ENGINES

Buda, Hercules, Hill diesels, rebuilt.
New and rebuilt Murphy diesels, ME-4 & 48.
GM 6 and 12 cylinder diesels, practically new.

Phone **HARRISBURG, PA. 7-3431**

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L. B. SMITH INC. CAMP HILL, PA. SUBURB OF HARRISBURG

WE OWN THE EQUIPMENT WE ADVERTISE

DIESEL POWER

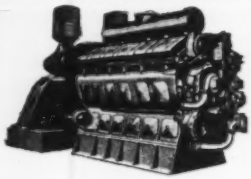
FOR

IMMEDIATE SHIPMENT

UNIT CAPACITIES—10 TO 1875 KVA

A.C.—50 AND 60 CYCLES

VARIOUS VOLTAGE



A PARTIAL LISTING OF OUR INVENTORY

KVA	Make	Mode	HP	RPM	KVA	Make	Model	HP	RPM
1875	Fairbanks Morse	38TF16	2000	300	375	Enterprise	DSG-6	450	450
1420	Fairbanks Morse	38D8⅛	1600	720	330	Superior	RNA	396	514
1250	General Motors	16-278A	1600	720	312	General Motors	8-268A	450	1200
937.5	General Motors	12-567	1080	720	312	Clark	MD-4	375	327
625	Alco	6-12¼x13T	750	600	125	General Motors	3-268A	150	1200
425	Baldwin	VO-6	510	450	75	General Motors	6043C	90	1200
400	Buckeye	80	480	600	62.5	Int'l Harvester	UD-18	75	1200

D.C. UNITS ALSO AVAILABLE

A. G. SCHOONMAKER COMPANY, INC.

DIESEL DIVISION, 50 CHURCH ST., NEW YORK 7, N. Y.

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For Immediate Delivery

100 Tons 8" x 36# Bearing Piles
100 Tons 10" x 42# Bearing Piles
100 Tons 12" x 53# Bearing Piles
100 Tons 8" x 31# H-Beams
100 Tons 10" x 49# H-Beams
100 Tons 12" x 65# H-Beams

We can book above sizes in all other weights for shipment from mill.

We can also furnish from stock I-Beams, Channels, Angles, and Plates.

Contact us for all Structural Steel items.

ALBRO STEEL COMPANY

47-29 VAN DAM STREET

LONG ISLAND CITY 1, N. Y.

STILLWELL 4-2720 DIRECT WIRE VIA
STILLWELL 6-5448 WESTERN UNION

CLASSIFIERS: 6—Akins and Wemco 54" and 78", single screw, double pitch, high weir, 220/440 volt motors. All new condition. Located Reno, Nev. 1—Dorr class DSFXD 8' x 39' rake, 22' dia. bowl, with motor and drive. New condition.

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DIESEL MOTOR: Caterpillar D13000 portable on skids, 122 H.P.

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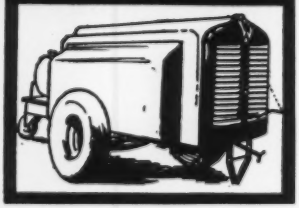

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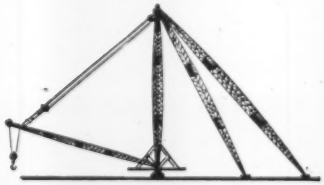

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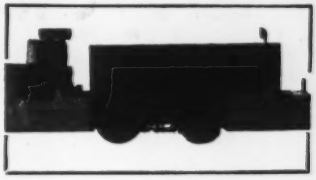

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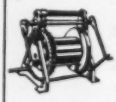

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Bogota-Hubbard 7-1408

Multi-purpose tractor blade ready

Any highway contractor who has struggled with landscaping, terracing, grading and scarifying problems will do well to look at the new multi-purpose blade shown here on the rear of a Ferguson tractor. In fact, anyone with these problems or drainage or snow removal chores might do likewise. The 6-ft. blade with 14-in. moldboard height can be angled through a full circle in multiples of 15 deg, permitting either pulling or pushing action. No tools are necessary to make the five-minute attachment to a Ferguson or Ferguson System tractor. Two stabilizer bars eliminate side sway. The entire moldboard and blade can be offset when needed on work close to fences and buildings. Because the double-edge scraper blade is mounted with bolts on the centerline, it is a simple matter to reverse it when a cutting edge becomes worn. By attaching the blade to the tractor links with an offset pin in the frame, the operator can dig a "V" ditch with a relatively small included angle.

In loose dirt or snow the blade-widening extension may be attached for greater material displacement. In addition, side plates used directly on the blade or in combination with blade extensions achieve maximum carrying capacity.

The grader wheel is for final leveling operations and blade height with respect to ground line is controlled by the pitch adjusting screw, which also regulates the amount of suck in the blade during different soil and operating conditions. Skid shoes can be attached in order to prevent direct blade contact with road surfaces when removing snow from gravel or concrete roads. This attachment also can be used to increase transverse blade stability when using the grader wheel kit to do leveling. HARRY FERGUSON, INC., 3639 E. MILWAUKEE AVENUE, DETROIT 11, MICHIGAN.

"Brik-Toter" sports bulk material attachment

A bulk material attachment, easily installed in 90 sec, converts any BRIK-TOTER into an excellent conveyor for sand, gravel and other bulk materials. The hopper and side guards assure no spillage and no over-loading of the portable masonry materials conveyor. The manufacturer states that excavation cost surveys show that one man with this unit can excavate at a far faster rate than three men by manual methods. In many cases the upper end of the BRIK-TOTER may be placed directly over a truck, eliminating a second lift from ground level. MAR RAIL CONVEYOR COMPANY, PAWTUCKET, RHODE ISLAND.

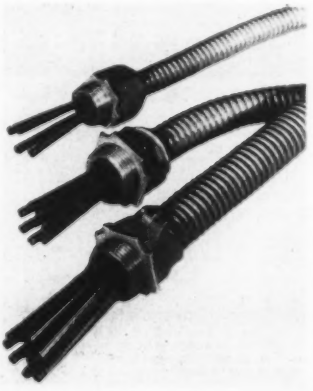
Three new industrial engines made by Ford

Three new heavy-duty industrial engines are being produced by Ford Motor Company. The new units, equipped with overhead valves, bring to six the number of Ford engines specially built for industrial applications. Also available is a new Ford Multa-Torque converter which offers all the advantages of a fluid coupling plus torque multiplication, and is designed to absorb shock overloads, prevent stalling under excess loads and start bigger loads faster. The "317" is a V-8 engine rated at 140 brake horsepower, 2800 rpm. The "279", also a V-8, is rated at 125 brake horsepower at 2800 rpm. The "215" is a 6-cylinder engine rated at 93 brake horsepower at 2800 rpm. (The numbers identifying each engine correspond to its displacement in cubic inches.) The Ford Multa-Torque converter is for use with the 215 as well as the 239 and 254 engines also manufactured by FORD MOTOR COMPANY, DEARBORN, MICHIGAN.

Cable used for pneumatic and hydraulic circuits

The Armortube cables pictured below not only resemble BX electric cable but can be installed and relocated almost as easily as BX. Instead of wiring, however, they contain 4, 8 or 12 pneumatic or hydraulic tubes. They have been designed to cut installation time and costs, protect instrument and control connecting lines, conserve space and improve plant appearance. Tubes are made of aluminum or copper and are capable of transmitting hydraulic control pressures as high as 3,000 psi and all ranges of pneumatic control pressures. Connections and take-offs may be made in standard electrical junction boxes, eliminating support racks. Standard pipe or conduit clips may be used for fastening to walls or ceilings, and 2 tracer tube easily identifies corresponding tube ends between cable connecting points, since all tubes in a bundle maintain the same position relationship. Armortube cable is a product of the BAILEY METER CO., 1022 IVANHOE ROAD, CLEVELAND, 10, OHIO.

(Continued on page 154)



To keep pipe from failing in this tough corrosion course

Genuine wrought iron main and return lines in tunnel installation under railroad tracks.

Genuine wrought iron steam transmission lines.

Villanova College used

BYERS WROUGHT IRON PIPE

In Villanova College, Villanova, Pennsylvania, the job of safeguarding four vital services was entrusted to genuine wrought iron pipe. Over 51 tons of Byers Wrought Iron pipe was used for steam supply, high pressure drip, condensate return and steam transmission lines in the boiler plant and distribution system. The transmission lines fan out from the new boiler plant to feed all the buildings on campus.

The steam transmission and distribution lines provide another impressive engineering endorsement of genuine wrought iron's proved dependability. Because plans called for the installation of these lines under the four track main railroad at Villanova station, the engineers voted for the long-life protection of this time-tested material to avoid the need for premature replacement. George M. D. Lewis was the architect; Gilboy and O'Malley were the consulting engineers; and Philadelphia Mechanical Contractors, Inc. were the contractors.

Boiler plants in every section of the country depend on the durability of genuine wrought iron. In a number of reported cases, genuine wrought iron has doubled, even tripled, the useful life previously obtained from low-first-cost piping material.

Our bulletin, WROUGHT IRON FOR PIPING SYSTEMS, discusses many corrosive conditions and illustrates many places where engineers have successfully applied genuine wrought iron. Write for a copy.

A. M. Byers Company, Pittsburgh, Pa. Established 1864. Boston, New York, Philadelphia, Washington, Atlanta, Chicago, St. Louis, Houston, San Francisco. Export Division: New York, N. Y.

Why Genuine Wrought Iron Lasts

This notch-fracture test specimen illustrates the unique fibrous structure of genuine wrought iron—which is responsible for the high corrosion resistance of the material. Tiny threads of glass-like silicate slag, distributed through the body of high-purity iron, halt and disperse corrosive attack, and discourage pitting and penetration. They also anchor the initial protective scale, which shields the underlying metal.

BYERS

CORROSION COSTS YOU MORE THAN WROUGHT IRON

WROUGHT IRON

TUBULAR AND HOT ROLLED PRODUCTS

ELECTRIC FURNACE QUALITY ALLOY AND STAINLESS STEEL PRODUCTS

Ever wonder why you *never* see a scowling, fagged operator on the Baker, A-C team? Here's why:

They just plain love that "doze-in-your-armchair" ease of control; that positive hold without throttle jockeying; that fraction-of-an-inch accuracy . . . that quick, direct lift; that positive down-pressure which puts almost all the tractor weight on the cutting edge; *and* the "roll-action" of the blade which leaves more tractor power for push. Because "Easy DOZE It!"

That's why you see the Baker, A-C team more and more wherever dirt has to be moved fast and efficiently. When operators *prefer* it, you can count on it being the best money-maker.

Specify Baker Bulldozers, Gradebuilders or Root Rippers for your new A-C Tractors . . . Baker makes engine-mounted hydraulic control models and cable-control models for the entire line of Allis-Chalmers crawlers. See your Baker, A-C Dealer. THE BAKER MANUFACTURING COMPANY, Springfield, Illinois.

P.S.: Baker is the PIONEER and the SPECIALIST in bulldozers

New Products . . .

Plastic and clay join to form leak-proof joint

After a good deal of research and experiment, The Robinson Clay Product Company has announced perfection of a revolutionary joint and ceramic pipe for industrial use in conveying liquids and gases. Known as "Screw-Seal", the new joint combines plastic with vitrified clay to form a leak-proof and infiltration-proof joint. Robinson industrial clay pipe is now manufactured with a threaded joint made of Plastisol, a vinyl resin dispersed in a fluid material, which becomes a rubber-like plastic upon heating. It is resistant to oxidizing atmospheres as well as to 54 different corrosive acids and to most noxious gases, including hydrocarbons. The new pipe and joint are available in 4-, 6-, and 8-in. internal diameters with standard fittings.

Each clay pipe end is made dimensionally accurate in the application of the plastic which is cast directly on the pipe with the outer surface molded to a tapered thread. This provides two male-threaded ends on the clay pipe which become an integral part for all practical purposes. Pipe lengths are joined together by means of a threaded pressure-molded plastic collar with matching female threads.

In assembling the joint the plastic collar is threaded over the stationary pipe end and the next section of pipe is turned into the collar by hand. Three revolutions by hand and a fourth and final turn with a strap wrench are needed. When installing branches and additions to lines already in service a pressure molded

(*Continued on page 157*)

AMCRECO.

PROTECT THE DANGER LINE!

Here's enduring protection at the ground line... where the greatest danger exists. Amcreco Creosoted Products, made from selected timber chosen to withstand heavy, severe driving, are pressure treated by the Lowry Process, refined and improved by Amcreco research, to assure maximum strength. For every job, Amcreco's advanced treating techniques assure longer service life and low maintenance. Take advantage of Amcreco's experience on your next job... our engineers will gladly work with you.

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for strength that lasts!

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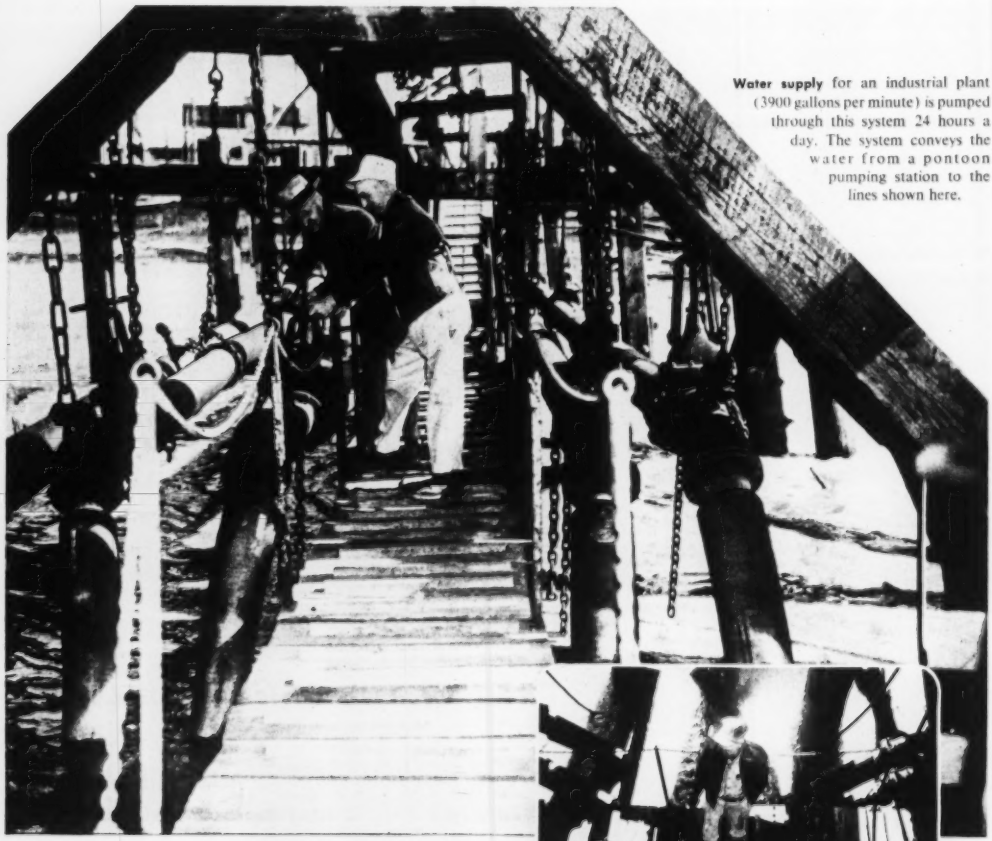
INCORPORATED

COLONIAL CREOSOTING COMPANY — GEORGIA CREOSOTING COMPANY

GENERAL SALES OFFICE—CHICAGO, ILLINOIS

What's U. S. Rubber doing to handle the rise and fall of Mississippi water?



Water supply for an industrial plant (3900 gallons per minute) is pumped through this system 24 hours a day. The system conveys the water from a pontoon pumping station to the lines shown here.

The U. S. Water Discharge Hose connect the pontoon intake and the pumping station to the water lines.

No longer does the 16-foot rise and fall in the lower Mississippi sever the water-supply lines of an industrial plant. United States Rubber Company engineers installed special Water Discharge Hose which act as "hinges" as the water rises and falls.

"U.S." makes hose of every nature and type. Moreover, "U. S." engineers will design special types for you. Very often they have solved problems quickly and economically by means of hose, where hose had never been used before. For more information, write to address below.

PRODUCT OF U.S.RUBBER SERVING THROUGH SCIENCE

UNITED STATES RUBBER COMPANY

MECHANICAL GOODS DIVISION • ROCKEFELLER CENTER, NEW YORK 20, N. Y.

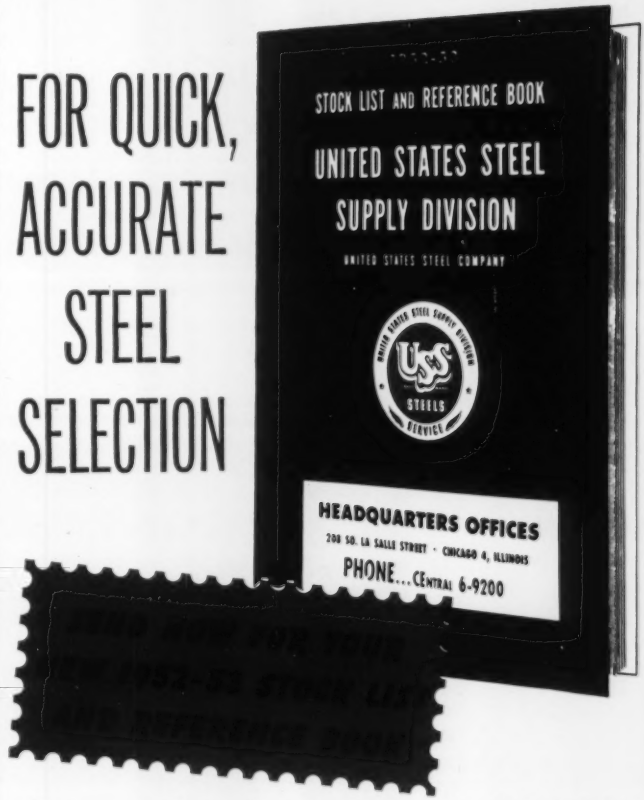
type union in the form of a split flange can be used. This joint offers quick assembly when connections such as elbows. T's and Y's are required or wherever space limitations prevent screwing of a full length of pipe into a collar. In this instance a band is placed over the threads to assure a smooth surface for the collar. When the bolt on each side of the collar is tightened, the Plastisol material is compressed into a tight joint. Screw-Seal has unusual flexibility—it can be deflected as much as 6 deg without leakage—and the sharp thread taper facilitates assembly even on large diameters. It also places the male threaded end in compression on the last turn of the pipe to insure tightness. In all three sizes it can withstand backloads of 2,000 lb per lineal foot and its coefficient of expansion is only 62-millionths per degree F. The Robinson Clay Product Company, Akron 9, Ohio.

Prefabricated door and jamb cuts work

Building and house contractors can forget about mortising, spacing, matching of locks and strikers, and a host of other problems which automatically come with installation of wooden doors. The Hasko "ready hung" door and frame can be installed in half the time needed for ordinary installations. Higher quality workmanship is a natural result of the mass production methods and precision machinery that allows factory craftsmen to cut, shape, mitre, join and assemble the unit with so much more ease and

(Continued on page 159)

FOR QUICK, ACCURATE STEEL SELECTION



● This easy-to-use, illustrated steel guide is packed with useful information and features:
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UNITED STATES STEEL

The Surveyor's Notebook

Reporting on Unusual Surveying Problems and Their Solutions

Notekeeper: W. & L.E. Gurley, America's Oldest Engineering Instrument Maker

Doing Something about the Weather

"I quite agree with R. Getty Browning's recent statement in 'The Surveyor's Notebook'* that many phases of surveying have not kept pace with the increasing accuracy of instruments," writes L. Mabry Adams of Cleburne, Texas. "Weather is one factor which should be taken into consideration more often.

"For example, allowances can be made for the wind. Chainmen should carry a weather vane while they are pulling the tape, *suspended*, since the resultant of the added pressure is felt by the direction and amount of sidesway of the tape from the vertical droop. Variables of pressures, angle of incidence, and flutter of the tape can all be cared for simultaneously in a correction of tension—derived by adding the product of the exsecant of the angle of sidesway *times* the tension of that portion of the tape used in still-weather measuring.

"When the sum of these reach the resultant of force of weight of the tape under the tension applied and directional force of the wind, the tape will begin a return swing—if not held by a steady pressure. Best results may be gaged by the maximum swing and tension coordinated at the instant of determination.

Near Cleburne, Texas, L. Mabry Adams' chaining crew snaps the sidesway in determining tension with wind allowances. Adams has used Gurley Transit 35 years.

Adams (at center of chained span) gives graduated offset-sight by horizontal measure as inspector (at stake beneath transit) applies tension to tension scale and reads awl-marked tack to nearest thousandth on temperature-scaled tape.

"Adopting such methods for Tension Control in Suspensory Measurements is an important adjunct to use of a good instrument. I grew up with, and have now been using Gurley Transits for 35 years. I have never found another transit I liked better on any job."

***Browning's plan** for improving land survey records and all the other stories and surveying tips from the first year's "Surveyor's Notebook" series have been gathered together and reprinted in permanent booklet form. Write for a free copy of "*The Surveyor's Notebook*" collection.

When writing for your bound copy of "The Surveyor's Notebook" stories, ask also for Bulletin 50. It gives full details on Gurley instruments.

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Surveying and Scientific Instrument Makers Since 1845

facility than the on-the-job carpenter with his hand tools.

Actual installation consists of three simple steps. Units are adjustable for wall thicknesses from 4¼ to 5¼ in. and come in all standard door sizes. All hardware is attached with the exception of knobs. HASKELITE MANUFACTURING CORPORATION, GRAND RAPIDS, MICHIGAN.

Germans produce bituminous-coal tar pitch

A new and special pitch called Synoplast has been developed in Germany and utilized in building construction. Synoplast has a plasticity range (difference between breaking point after erosion and melting point, Kraemer-Sarnow test), of 65 deg or more. A greater stability is thus represented at higher temperatures with no embrittlement at low temperatures. It can be utilized, in its proper gradation, also as adhesive matter for steep board roofs; it can be used for jointings and as protective agents for various purposes.

By adding appropriate filling compounds, which do not impare its processing qualities, plasticity and stability have been further enhanced. Such filled material is called Synoplast F and is utilized for all purposes requiring a particularly high stability, e.g. the insulating of steel and cast-iron pipes and submerged containers. VfT (Association for the utilization of tar) ESSEN, GERMANY.

Heater burns liquid fuel in form of gas

A Connecticut research and development company has announced a heating device which burns liquid fuel in the form of gas and is said to save 20 to 50 percent on household and industrial fuel bills. The manufacturer claims that the device can be installed in standard hot water and heater oil burner tanks and will supplant the present pot-type burner and gun-type atomizing oil burner. A hot water heater using this unit is said to burn heavier fuel more efficiently, and will leave no carbon. It also requires no chimney or draft. The principle involved in both hot water and heating units is the vaporization of the liquid fuel by means of regenerated hot air. The unit generates gas from heavy liquid fuel such as kerosene, or No. 1, 2 and 3 fuel oil and is said to give the user advantages of gas combustion with the economy of fuel oil. ROBERT REICHHELM COMPANY, STRATFORD, CONNECTICUT.

(Continued on next page)

introducing the...

"One Armed Bandit" that pays off...

MODEL H SCOOPMOBILE
FULL HYDRAULIC
FRONT END LOADER

Shovel, Load and Transport
All Types of Bulk Material

The Model H SCOOPMOBILE with full hydraulic steering lift and bucket control is an outstanding material handler. Built for hard work, it gives top performance under all conditions. Planetary drive with 3-to-1 reduction ratio gives dependable power for all operations. Conveniently located finger-tip controls give the operator in cab full-vision command of every movement. Vickers hydraulic power steering gives positive control and lessens operator fatigue.

The versatile Model H SCOOPMOBILE with ¾ cu. yd. scoop has rated lifting capacity of 4,000 pounds and standard dumping height of 8 feet. Quick-change attachments include swivel-type concrete hopper, lift forks, special fertilizer or hay fork, and crane boom...and make the Model H SCOOPMOBILE an efficient multi-purpose unit.

EXTRA-LOW IN INITIAL COST... EXTRA-HIGH IN EFFICIENCY

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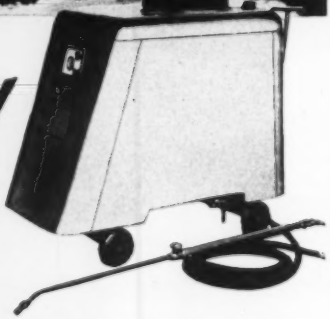
. . . You can cut Equipment Repair Time as much as 40% with

HYPRESSURE **Jenny**

Steam Cleaner



Time studies show that repairmen, working on dirty machinery, spend up to 40% of their time wiping mud, muck and grease from tools and equipment. JENNY steam cleaning, *before* repairs or reconditioning, saves those lost man-hours; cuts equipment repair time—and expense—practically in half; gets your equipment back into service—and earning—nearly twice as fast.

JENNY steam cleaning is 10 times faster than hand-cleaning methods. One man using Hypressure JENNY, can do more cleaning in an hour than 10 men can accomplish in the same time by solvent-brush-and-scraper methods.

JENNY cuts time and labor costs 90% on jobs such as cleaning brick, tile, stonework, concrete, building exteriors and preparing bridge and structural work for painting.

Hypressure JENNY is sturdy, portable, safe, economical. Ordinary labor can operate it.

Send for free illustrated booklet, "1001 Ways to Extra Profits with Hypressure Jenny." No obligation.

Hypressure Jenny Division

HOMESTEAD VALVE MANUFACTURING COMPANY

"Serving Since 1892"

P. O. BOX 31 CORAOPOLIS, PENNSYLVAINIA

New Product Briefs . . .

A **built-in generator** has been developed for use with **Towmotor electric pallet trucks**, eliminating the need for conventional electric storage batteries and re-charging. It provides constantly available power for 24-hr operation. It is an adaptation of the standard electric pallet truck made by **Towmotor Corporation, Cleveland, Ohio**, with a small, gasoline-powered generator supplying constant, maximum voltage for operation.

A new **load binder** on the market, designed principally for military use, uses the compensating action of a sturdy spring. Over all types of terrain and under all manner of conditions the spring binder maintains constant, uniform tension, eliminating breakage of chain and hooks to a marked degree. Four models begin at 9000 lb capacity, and the spring gage provides continuous take-up action despite change in sling lengths after delivery of partial loads. Manufactured by **Canton Cast Products Company, 2460 13th Street, N.E., Canton 5, Ohio** they have been accepted after thorough performance and safety tests.

Hyflex gloves, a new line of **plastic-coated gloves** which will protect against water, acids, alkaline materials, oils and a variety of other corrosive chemicals, have been placed on the market by **Houghton Laboratories, Inc., Olean, New York.** These canvas gloves are coated with abrasion-resistant vinyl plastisol. The new application process makes possible exceptional adhesion to the canvas and freedom from pinholes.

Blackhawk Mfg. Co., Milwaukee is making a **tension wrench** that flashes a light when the proper torque has been applied. The 50-lb capacity wrench is equipped with a tension scale with readings calibrated in all standard units. Special applications—installing sparkplugs, regulating automatic transmissions and for similar automotive mechanical functions.

Pocket-size **beam load selector** has been devised for those who specify or use UNISTRUT metal framing, to quickly determine the amount of weight which can be supported by various UNISTRUT sections under varying conditions of span and unbraced height. The selector also accurately determines number of sections required to support a given load. One may be obtained by writing to **Unistrut Products Company, 1013 West Washington Boulevard, Chicago 7, Illinois.**

(Continued on page 162)

Oil exploration crews get more work done per day by using the Model LD. They keep on schedule because

this new light-duty FWD is a true 4x4!

When the rains come and the going is soft, the LD can travel while other trucks must stay at home. Its g.v.w. is 14,500 lbs.

Pays out on smooth highway, too! For general hauling or patrol work, the LD is a growing, economical favorite.

Many snowfalls and icy conditions are easily brought under control by this *light-duty* LD. The center differential of the LD eliminates stresses. That, plus other reasons, is why the LD works on assignments that often shove conversions and conventional trucks into the repair shop. Proof, too, of the LD's superiority in all seasons on a great work range. Ask FWD or your FWD distributor for facts. The FOUR WHEEL DRIVE AUTO CO., Clintonville, Wis. *Canadian factory*, Kitchener, Ontario.

Built by the Makers of America's Foremost Heavy-Duty Truck

You buy more than a truck When you buy an FWD

***Extra-traction* and *proper distribution* of weight and power give you the following:**

- Ability to work more days per year
- Ability to handle more jobs
- Ability to travel easily and safely on or off the highway
- Ability to haul legal loads economically
- Lower maintenance costs (up to twice the front tire life, for example)
- Up to twice the truck life

World-wide Sales and Service

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ENGINEERING NEWS-RECORD

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MANUFACTURERS' PUBLICATIONS

Bromine for swimming pools—Here is a 4-page folder which advocates the use of bromine for better, safer, more effective disinfection of swimming pools. It explains how the supply of bromine is unlimited and shipping and handling is safer since the material is not under pressure and will not blow up. Along with the folder is a question and answer sheet containing most often used questions concerning bromine and clear, full answers on the subject. For further information including bromine feeders contact Halogen Supply Co., 4653 W. Lawrence Avenue, Chicago 30, Illinois.

Hopper car unloader—Bulletin 1530 concerns the latest material handling development, namely the Lippmann belt type hopper car unloader. The company describes it as a hopper car unloader with economies of belt conveying. Rated capacity has been stepped up to 300 tons of coal per hour and the machine is said to equally handle coke, sand, gravel, crushed stone or any other bulk material. The rubber-covered rollers eliminate elaborate hold-down devices where the horizontal boom meets the elevator. Write Lippmann Engineering Works, 4613 W. Mitchell Street, Milwaukee 14, Wisconsin.

Moving large volumes of air—A compact 4-page folder on the M.S.A.-Lamb Air-Mover describes the adaptability of the instrument for use in industrial plants, mines and wherever else circumstances make it necessary to remove air contaminants from confined areas or to introduce fresh air for ventilation or rapid cooling. Employing compressed air or steam in its principle of operation, the horn-shaped device converts pressure into a large induced volume of moving air. Bulletin DP-5, Mine Safety Appliances Company, Pittsburgh 8, Penna.

Conduit products selector—Designed to aid any electrical contractor, electrician, inspector and maintenance, a new two-sided box guide and raceway calculator is available from GE. It will easily compute the allowable conduit fill for various sized rubber, thermoplastic or lead-covered conductors by a simple dialing operation. The reverse side determines the number of conductors allowed in commonly used outlet, switch and utility boxes. All tables are from 1951 National Electrical Code. The selector, No. 18-111, is available from Construction Materials Dept., General Electric Company, Bridgeport 2, Conn.

For Utmost Security

IMPORTANT AMERICAN CITIES INSTALL

LOCK JOINT

CONCRETE PRESSURE PIPE

More than anyone else, those responsible for supplying water for domestic or industrial use appreciate the value of pipe lines which provide these four freedoms.

Freedom from:

- ★ Rupture or blow-out
- ★ Maintenance and repairs
- ★ Loss of carrying capacity
- ★ Corrosion or deterioration

The water works man who installs Lock Joint Concrete Pressure Pipe will have trouble free pipe lines. The careful design of Lock Joint Pressure Pipe does not permit blow out or rupture; its dense concrete walls are immune to tuberculation, corrosion or electrolytic attack; and its useful life has been estimated by competent hydraulic engineers at more than 100 years. Among Lock Joint's strongest supporters are the water works officials who have installed this type of pipe and who point to it as the most economical in their systems.

• • •

If you are quality minded yet cost conscious, specify Lock Joint Pressure Pipe, secure in the knowledge that you are receiving the best value the pipe industry can provide.

LOCK JOINT PIPE COMPANY

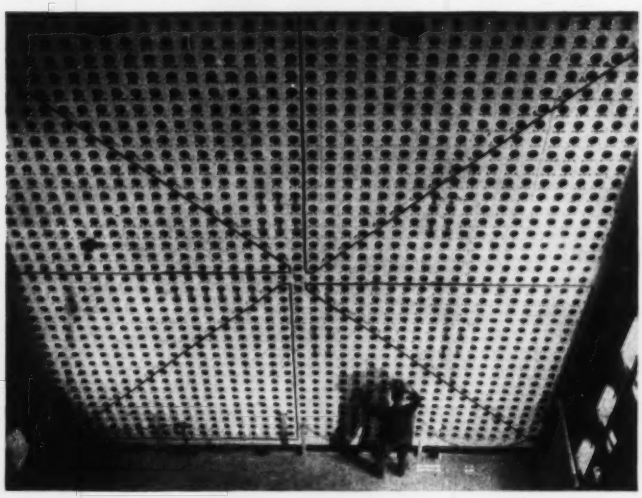
Est. 1905

P. O. Box 269, East Orange, N. J.

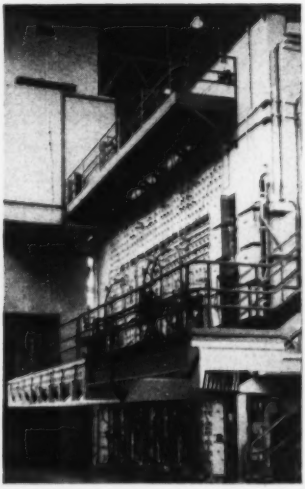
Pressure Pipe Plants: Wharton, N. J., Turner, Kan., Detroit, Mich., Columbia, S. C.

BRANCH OFFICES: Cheyenne, Wyo. • Casper, Wyo. • Denver, Col. • Kansas City, Mo. Valley Park, Mo. • Wichita, Kan. • Chicago, Ill. Rock Island, Ill. • Kenilworth, N. J. • Hartford, Conn. • Tucumcari, N. Mex. • Tulsa, Okla. Oklahoma City, Okla. • Beloit, Wis. • Bate Rep, P. R.

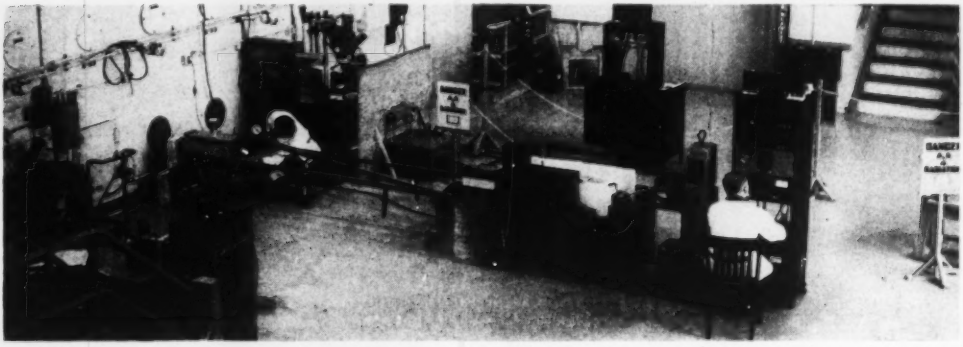
SCOPE OF SERVICES—Lock Joint Pipe Company specializes in the manufacture and installation of Reinforced Concrete Pressure Pipe for Water Supply and Distribution Mains in a wide range of diameters as well as Concrete Pipes of all types for Sanitary Sewers, Storm Drains, Culverts and Subaqueous Lines.



LOADING THE FURNACE—Tons of pure uranium metal are loaded through holes in this shielding wall of the Brookhaven reactor.



ON OPPOSITE FACE pneumatic system permits speedy preparation of samples.



EXPERIMENTAL EQUIPMENT at the east face of the reactor enables beams of neutrons to emerge through ports for studies of their properties or of materials they strike.

Secrets of "atomic furnace" revealed

Photos showing certain structural details of the Brookhaven, N. Y., reactor (ENR Apr. 19, 1951, p. 37) have just been released by the U. S. Atomic Energy Commission. Brookhaven National Laboratory is operated by Associated Universities, Inc. under contract with the Atomic Energy Commission.

Both the reactors at Brookhaven and at the Oak Ridge National Laboratory in Tennessee are low-power reactors and are designed for research and production of radioisotopes, AEC reports.

Their removal from secrecy classification is intended to "advance the art" of reactor technology. It will help industrial concerns and universities now studying how to build their own reactors for research or for production of energy which can be converted into electrical power for many peacetime applications.

The reactor is a 25-ft cube composed of some 60,000 pieces of graphite. The cube is split vertically in the center to produce a gap where thousands of cubic feet of air are used to cool the reactor. After the air circulates through each half of the cube, it is collected in two spaces called plenum chambers before being discharged.

The cube and chambers are enclosed in a concrete shield five feet thick. Width is 38 ft, including the shield, length is 55 ft including the shield and two plenum chambers.

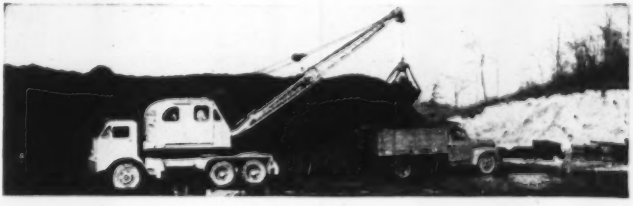
The reactor can be thought of as an "atomic furnace", AEC says. In it graphite is the housing and uranium metal, the "fuel" which "burns," or fissions in a chain reaction.

Tons of pure uranium metal are loaded through the holes of the south side or face, before the uranium atoms can fission.

Reclaiming coal

Rupp Brothers, Incorporated, general contractor of Kittanning, Pennsylvania, use one of their five MICHIGAN Truck Excavators to reclaim coal for the Powell Coal Company. Coal formerly lost by diverting coal washings into rivers and streams is now pumped into settling pits and reclaimed by the mine. Rupp Brothers use this ½-yard MICHIGAN clamshell to spread the still wet coal dust over high ground for drying.

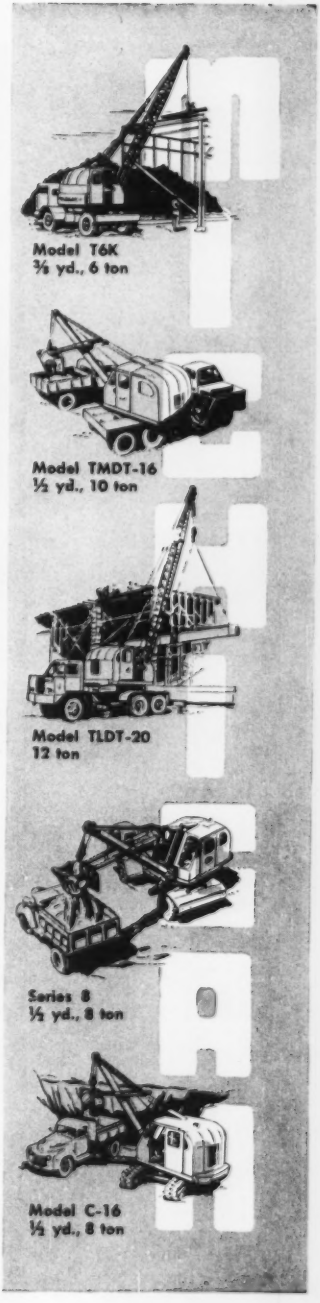
Says operator Ken Rupp: "MICHIGANS are tops with me. They're fast and easy to maintain. I especially like the air controls". States A. L. Rupp, president: "Our MICHIGANS require very, very little maintenance. They're always available so we get contracts others can't handle because their equipment is tied up for repairs".



Make your next excavator-crane a MICHIGAN . . . you, too, will be 'way ahead. Send for details.

MICHIGAN POWER SHOVEL COMPANY

500 Second Street, Benton Harbor, Michigan, U.S.A.



Kneads more road—needs less maintenance

with help of TIMKEN® bearings

UNIQUE in the field of road construction, these pneumatic tired rollers, built by Tampo Manufacturing Company of San Antonio, Texas, compact road materials by a kneading action. It is claimed that they can be pulled at speeds of 10 to 12 miles per hour—about three times the normal speed of a three-wheel or tandem roller.

And to help keep the rollers on the job and ready to go, Tampo designers have mounted the wheels of both the 9-wheel and 13-wheel rollers on Timken® tapered roller bearings. Timken bearings carry the heavy loads up to 10 tons including ballast when the rollers are working—and they permit higher rolling speeds when the rollers are transported from one job to another.

Due to line contact between rollers and races of Timken bearings, extra load-carrying capacity is provided. There's less chance of breakdown on the job.

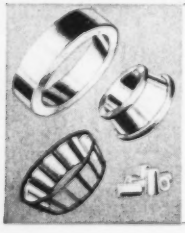
Because of their tapered construction, Timken bearings carry both radial and thrust loads in any combination. Wheels are held in proper alignment, wear is reduced.

Timken bearings keep housing and shaft concentric, so closures are more effective. Dirt, dust, and water are kept out—lubricant kept in. Lubrication time and maintenance are reduced.

For top bearing performance in whatever machinery you build or buy, be sure to specify Timken bearings. No other bearing can offer all the advantages of Timken bearings. Look for the trade-mark "Timken" on every bearing. The Timken Roller Bearing Company, Canton 6, Ohio. Canadian plant: St. Thomas, Ontario. Cable address: "TIMROSCO".

This symbol on a product means its bearings are the best.

TAMPO MANUFACTURING COMPANY mounts wheels of their 9 and 13-wheel pneumatic tired rollers on Timken tapered roller bearings for minimum maintenance, long life.



DESIGN LEADERSHIP

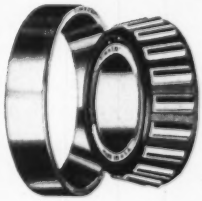
The first Timken tapered roller bearing was produced in 1898. Since then the one-piece multiple perforated cage, wide area contact between roller ends and ribs, and every other important tapered roller bearing improvement have been introduced by The Timken Roller Bearing Company.

The Timken Company leads in: 1. advanced design; 2. precision manufacture; 3. rigid quality control; 4. special analysis steels.

TIMKEN

TRADE MARK REG. U.S. PAT. OFF.

TAPERED ROLLER BEARINGS



NOT JUST A BALL ○ NOT JUST A ROLLER ⬭ THE TIMKEN TAPERED ROLLER ⬭ BEARING TAKES RADIAL ⬯ AND THRUST ⬯ LOADS OR ANY COMBINATION